FOOD ENGINEERING

February 1952

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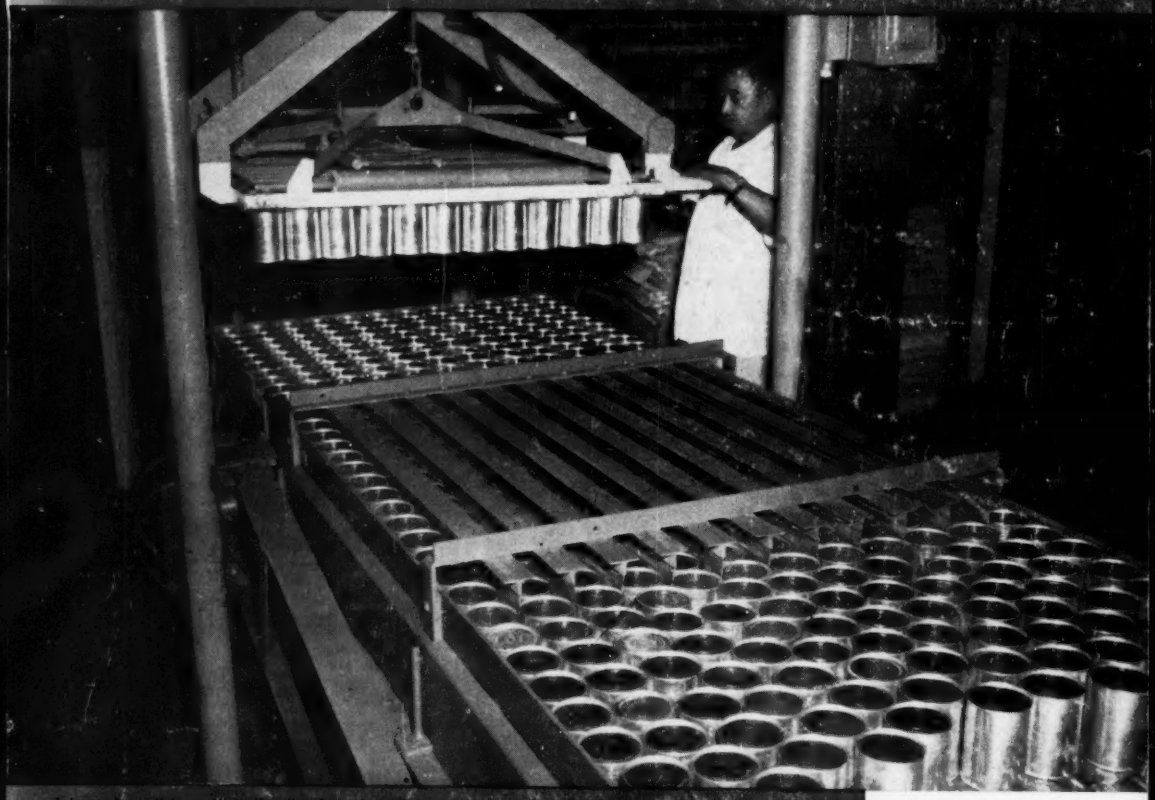

Labor-saving palletizer stacks Hawaiian Canneries' filled bright cans in two tier-of-cases assemblages. page 66

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Card Inside Back Cover

PUTTING IT ON THE LINE...

in Industry after Industry!

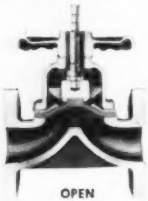
The Grinnell-Saunders Diaphragm Valve . . . . . .

Here's why . . . Piping in today's complex industrial plants is an exacting science involving the handling of highly corrosive fluids, gases, compressed air, beverages, foods and suspended solids . . . in lines where corrosion, abrasion, contamination, clogging, leakage and maintenance are costly factors. Under such conditions, the amazing adaptability of the Grinnell-Saunders Diaphragm Valve explains its acceptance by industry after industry.

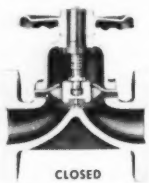
Bodies of this versatile valve are made in a variety of metals — iron, stainless steel, bronze, aluminum and others. *But of more importance* is the fact that a body of cast iron (a metal not in short supply) can be lined with glass, lead, natural rubber, neoprene and other materials which, in many instances, handle corrosive fluids *better* than metals.

Diaphragms come in natural rubber, neoprene, butyl, hycar, a special synthetic for foods, and **KEL-F**. This last is chemically inert to all acids and alkalies in all concentrations with the exception of molten alkali metals.

From this broad selection of materials, the problems which the Grinnell-Saunders valve can solve are extremely varied. No wonder industry after industry is putting it on the line.



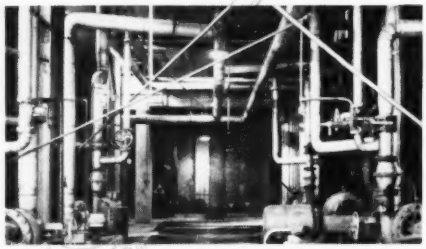
Showing rising spindle . . . valves are available with rising or stationary spindle.



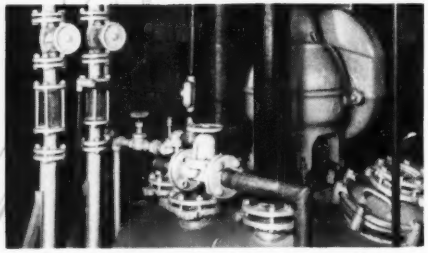
KEL-F diaphragm, using special rubber backing cushion and floating tube nut design.

CHECK THESE GRINNELL-SAUNDERS FEATURES...

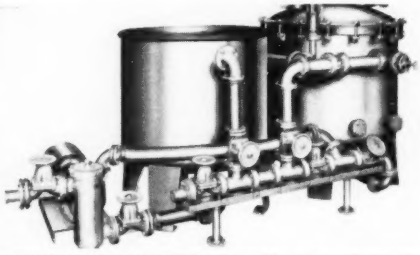
- Diaphragm absolutely isolates working parts from the fluid.
- Diaphragm lifts high for streamline flow in either direction.
- Diaphragm presses tight for positive closure.
- Body, lining and diaphragm materials to suit service.
- Simple maintenance — diaphragm easily replaced.



PULP AND PAPER MILL. Rubber-lined Grinnell-Saunders Valves on stainless steel piping handle sulphate pulp stock in bleach plant of Potlatch Forests, Inc., Lewiston, Idaho



CHEMICAL PLANTS. Glass-lined Grinnell-Saunders Diaphragm Valves, with KEL-F diaphragms, handle chlorinated organic chemicals at Hooker Electrochemical Company, Niagara Falls, N. Y.



EQUIPMENT MANUFACTURERS. Grinnell-Saunders valves with rubber linings are standard on filtration equipment for solution clarification, made by Industrial Filter & Pump Mfg. Co., Chicago, Ill.

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pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
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Food Engineering

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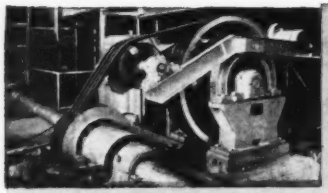
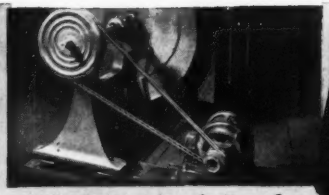
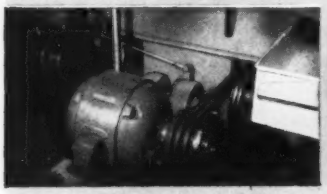


Paper Making Machine—Motion Control *Vari-Pitch* drive synchronizes paper machine sections.

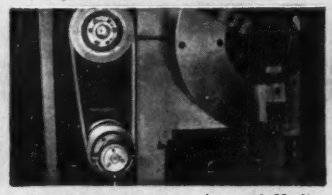


Air Conditioning unit — Stationary Control *Vari-Pitch* drive provides for seasonal adjustments.

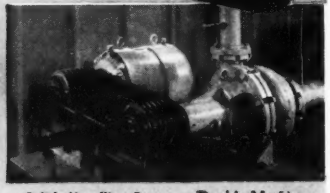
TEXROPE Drives for Speed Control



Cigarette Making Machine — Stationary Control *Vari-Pitch* drive provides for infrequent speed changes.

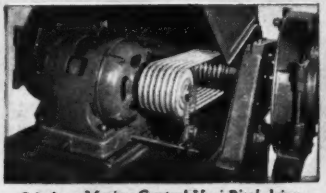


Pipe Threading Machine—Automatic *Vari-Pitch* drive gives simple, stepless handwheel speed changes.



Solids Handling Pumps—Double Motion-Control *Vari-Pitch* drive provides extra wide speed range.

Automatic lathe — Automatic *Vari-Pitch* sheave gives stepless speed changes for making ultra-fine finish.



Grinder—Motion Control *Vari-Pitch* drive holds cutting speed constant as diameter of wheel wears.

Conveyor — *Vari-Pitch* Speed Changer raises or lowers speed to meet production requirements.

HOW USERS PROFIT
With *Texrope* Adjustable Speed Drives

TAKE A TIP from these users. Get the speed you need for peak efficiency by adding *Texrope* variable speed drives. Best of all, no elaborate equipment — no special costly motors are required.

You'll increase efficiency . . . get maximum output when you adjust speed to meet variations in: the part processed; tooling; machine loading; and temperature and humidity.

There's a type or size *Texrope* adjustable speed drive to fit any requirement. Whether you need to change speeds rarely or frequently — when the machine is shut down, or when it's running — whether you're using one horsepower or 50, Allis-Chalmers can supply you.

In addition, Allis-Chalmers offers you more than the drive itself. A-C offers the extra engineering skill that naturally results from having more industrial V-belt installations than any other manufacturer. This in itself is important.

Get section 20P50 for complete engineering information on *Vari-Pitch* sheaves from your A-C Authorized Dealer or Sales Office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Choose from These Types of Variable Speed Drives

VARI-PITCH SHEAVES for A-B, B, C, D, and E belts — speed variation 15% to 25% per sheave. Capacities 1 to 125 hp. Stationary type — for changing speed when motor is stopped. Motion Control type—for changing speed when motor is running.

WIDE RANGE VARI-PITCH SHEAVES for Q or R wide belts provide up to 2 to 1 speed range . . . fractional to 40 hp. Available in Stationary Control and Automatic types.

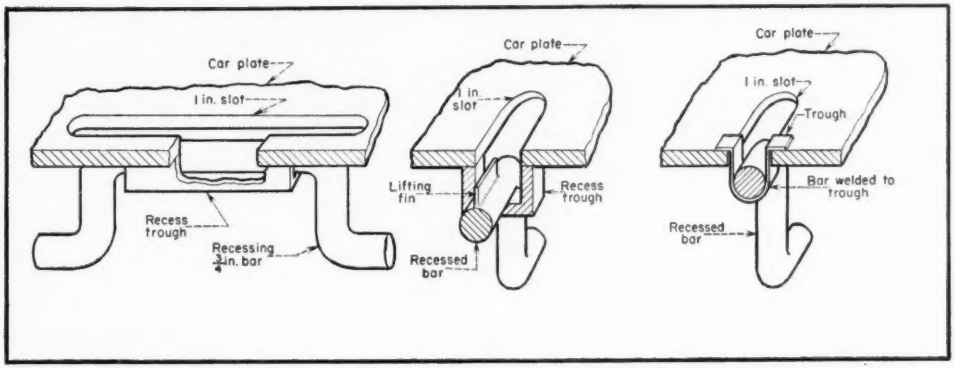
VARI-PITCH SPEED CHANGER — enclosed unit for adjusting speed while machine is in motion. Provides up to 3.75 to 1 speed range. Capacities 1 to 75 hp.

A-3262

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

PRACTICAL IDEAS



Portable Freight-Car Plates

By aid of a special contrivance, easily made and at little cost, car plates can be moved rapidly from car-door to car-door by fork truck.

These car plates, for spanning the clearance between loading dock and railroad car, must be of thick metal and be reinforced if they are to support the weight of fork trucks with pallet loads. Hence, they are very heavy. And "juggling" these weighty cumbersome plates is not only hard labor, but quite hazardous if the maneuvering is by hand.

The answer is a metal loop or hook at the center of the plate, through which the truck's fork will pass. The loop must drop down through a slot in the plate so that trucks will incur no interference as they pass over the plate. Also necessary is a device for holding the loop suspended below the slot. And a convenient method of raising the loop through the slot will prove time saving.

Here are several arrangements that will prove satisfactory: In each case, a slot is cut in the plate at the center and parallel to the loading platform. Slot length must be at least 2 in. longer than the width of the truck fork. And slot width should be 1 in. to allow a loop of ¾-in. bar to move freely through the slot.

Shape a bar of ¾-in. steel in the form of a flat-bottomed U (sketch at left). The width inside the U is just enough to permit the truck's fork to pass through easily. Now bend the ends of the bar out to extend at least 1 in. from the outsides of the U. These extensions engage the plate.

Bar dimensions will be such that when the bar is raised through the slot, the U extending above provides ample space for the fork to go through.

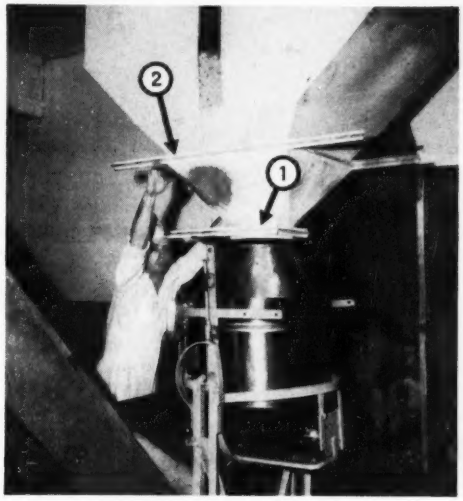
When recessed, the bar rests on a flat or round-bottomed trough, 1 in. wide and 1 in. deep. This trough is welded, on both side of the slot, to the underside of the plate.

With this arrangement, the recessed bar is placed in position to be engaged by the truck fork by pushing it up from below. Lifting the bar in place is easier if a fin (center sketch) is welded on top of the bar, high enough to be reached from above through the slot, but not high enough to extend above the plate.

Still another method of making the bar easy to lift is to build the trough in which the bar is recessed so that it can be suspended from the top side of the plate. This can be done as shown in the final sketch.

When this method of recessing is employed, the bar should not rest free in the trough, but be welded to it. Metal from which the trough is fabricated may be of light gage. Thus, little interference is offered the truck wheels by the overlap of the trough on top of the plate.

Any one of these three arrangements will speed transporting car plates and reduce the chances of accidents.—*W. F. Clow, Riverbank, Calif.*



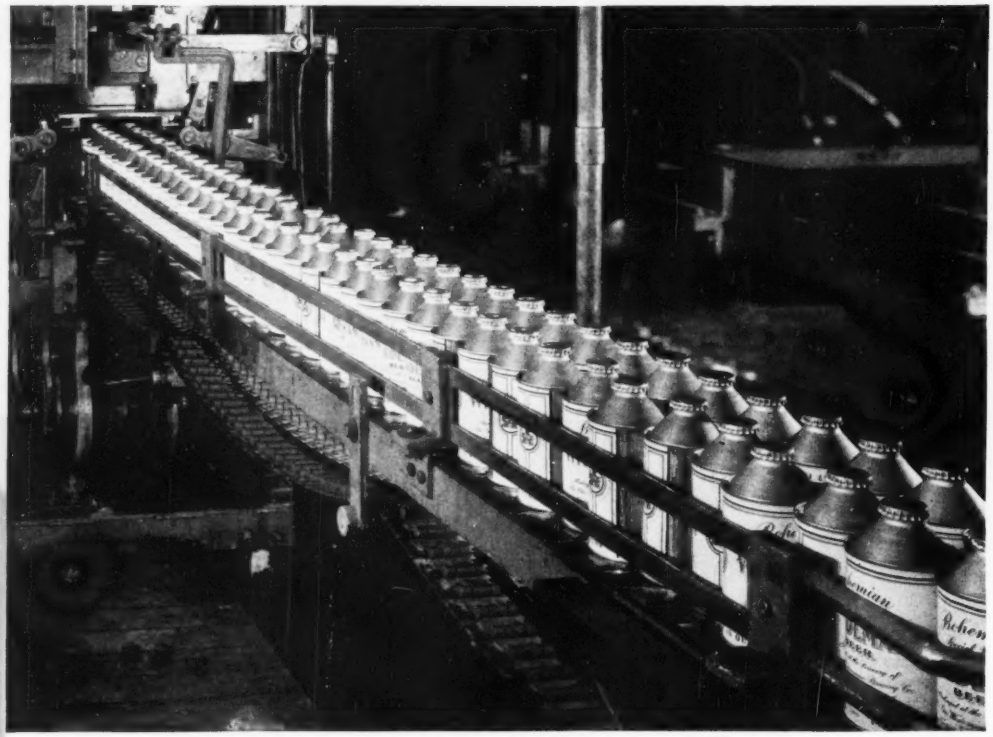
Valves Measure Hopper Discharge

Two slide-valves, made of sheet metal and angle iron, were fabricated in our plant to discharge a measured amount of product from a supply hopper.

Our problem and how the valves solved it may be briefed as follows: Popped corn, after screening, is conveyed to a hopper, from which it is discharged into a stainless steel drum. In this motor-driven unit, which rotates in a tilted position, the popped corn is salted, coated with cheese preparation, or otherwise processed.

Since ingredients are added in predetermined amounts

no ONE chain serves every purpose



S-815 flat top chain carrying cans of beer at The George Wiedemann Brewing Company, Newport, Ky. This sturdy, economical medium is easily kept clean and assures a smooth ride for such products.

LINK-BELT offers the RIGHT chain for every job... engineered to meet your requirements

Typical conveyor chains from the complete Link-Belt line

Class RC crescent flat top chain—travels in horizontal planes, around corners; ideal for bottles and cans.

Class 400 swivel chain—carries cartons, cases, etc. over paths with both vertical and horizontal turns.

Class RC flat top chain—precision made for smoothest, spill-free carrying and long life.

Class RC universal crescent flat top chain can be used for multiplane operation traveling variety of paths.

Link-Belt offers no single "cure-all" chain to handle every job. From the most complete line of chains and sprockets—we can recommend the best type to fit your particular requirements—cast, combination, forged and fabricated steel, roller or silent. So, whatever your chain problems, large or small, Link-Belt engineers will work with you or your consultants to help solve them.

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12,842-C

LINK-BELT

CHAINS AND SPROCKETS

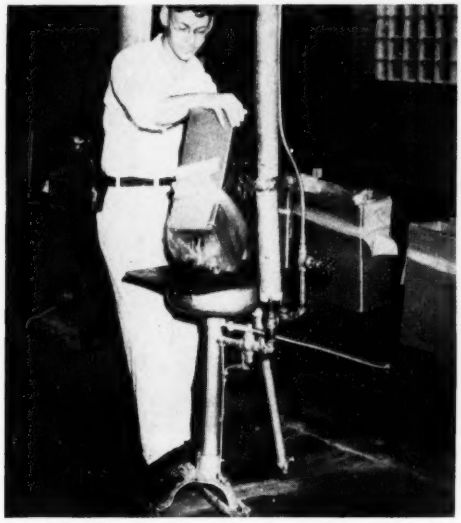
by proportioning pump or other measuring device, the volume of corn delivered from the hopper must not vary if the end product is to be uniform.

By reconstructing our hopper discharge with addition at two different levels of sliding plates to serve as valves, a measured volume of popped corn is now assured with each discharge from the hopper.

When the discharge of a finished batch is completed, we close the lower slide—(1) in photo—which controls the release of the product from the hopper. Upper slide (2) is then opened to fill the space between the two slides. Since the upper valve-slide is of large area, filling of the space between the two slides is very rapid.

Then when the upper slide is closed, the volume of corn in the compartment is the correct amount to charge the rotating drum, and is delivered when slide (1) is pulled out.

When it is desirable to discharge a differing amount from the hopper, the assembly can be removed and be replaced by another compartment delivering the newly specified proportion.—*L. C. Pagel, Technical Director, Red Dot Foods, Inc., Madison, Wis.*



Can Washer Aids Carton Forming

Speedier carton assembly, plus prevention of carton contamination by coliform bacteria, are two benefits that have been gained by converting a milk can washer into a machine for lining cartons.

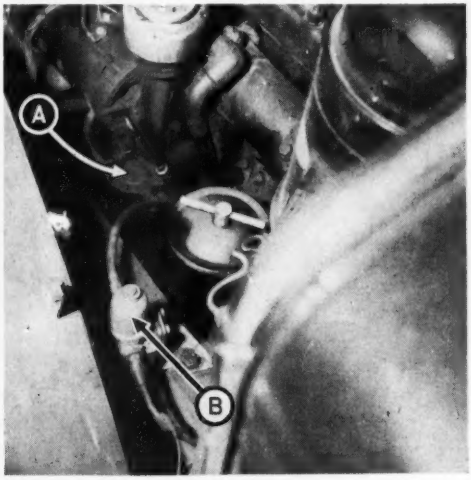
This was demonstrated at Borden's Pioneer Ice Cream Division after adoption of polyethylene-lined cartons as containers for high butterfat cream had posed a real problem at the company's Gouverneur, N. Y., plant.

How could the liners be made to conform to the inside of the carton without the aid of hands? Chances of coliform bacteria contamination were far too great if liners were manually fitted.

To overcome this difficulty, a small single-unit milk-can washer was located near the conveyor transporting the cartons. Over the basin at the top of the washer was fitted a steel plate somewhat larger (see photo) than the carton top. Cut in the center of the plate was a hole to permit the hot water nozzle of the can washer to extend through. However, the nozzle was not connected to a water line—instead, compressed air was piped to the machine and connected.

Now, during carton assembly, no attempt is made to hand-fit the liners into the containers. In the new system, the top edges of the liners are turned over the box flaps (photo). Each carton is then upended over the air outlet of the can washer, and blast of air is released into it from the nozzle when the operator presses the foot pedal controlling the air valve.

Carton edges form a seal against the plate on the washer—so that air forces the liner to conform to the inside of the carton. Containers are then ready to be filled with the plastic cream, at minimum risk of contamination. —*J. Thomas Chapman, Plant Engineer, Pioneer Ice Cream Div., The Borden Co., Gouverneur, N. Y.*



Second Fuel Pump Cuts Enroute Repairs

Installation of auxiliary fuel pumps on engines of tractor-trailers operated by a large New England bakery has removed one of the major causes of time-out for roadside repairs—the frequent cause of late deliveries.

Bulk of deliveries by the trailers requires travel at night or during early morning hours. And roadside repairs at these hours generally take longer than in daytime, with the driver often having to make his own emergency repairs.

In order to minimize delays of such roadside maintenance, a study was made to determine the most common causes of engine trouble. Results of study, gathered over a long period of time, indicated fuel pump failure was No. 1. Answer was to install an auxiliary fuel pump to serve as a standby in the event of failure of the engine's own pump.

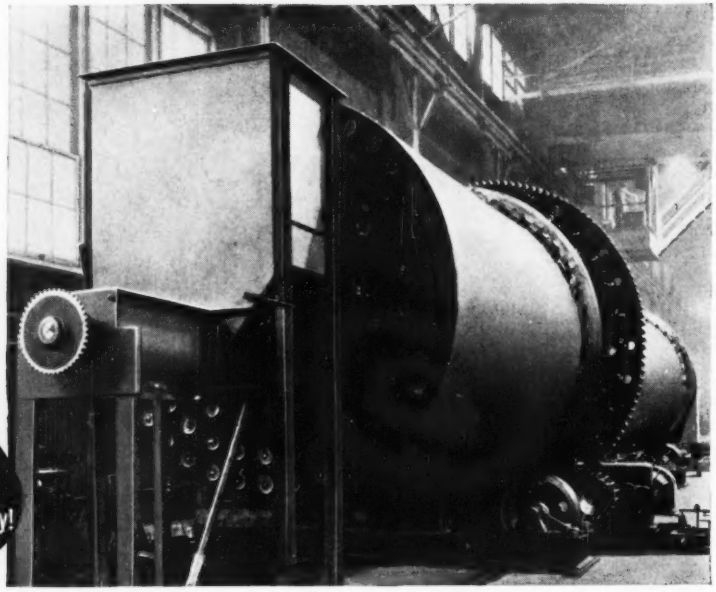
Regular fuel pump (A in photo) is operated from the motor cam shaft. The auxiliary pump (B) is driven by a motor using battery current.

Two ways are suggested for fuel-line connections. The fuel line from gas tank may be set up to deliver to a two-way cock. Then, when Pump A fails, switching position of the cock sends fuel to Pump B, at the same time closing the line to Pump A.

A better method, however, is to connect a T fitting onto the line from the gas tank, with valve control lines from the T feeding each pump. An auxiliary pumping system thus installed quickly puts a stop to delayed deliveries due to fuel pump failures.—*FE Staff.*

See Louisville for
CREATIVE DRYING ENGINEERING

LOUISVILLE ROTARY DRYERS utilize 85% of all available heat in steam!



KNOW THE RESULTS before you buy!

Extremely high thermal efficiency is just one of the basic engineering advantages of Louisville steam tube Dryers. Any danger of case hardening is eliminated. Because of a very low air flow, finely divided material lost from the dryer cylinder is relatively small even though dryer may be handling unusually dusty material. Arrangements are included in each Louisville Dryer for complete and continuous removal of condensed steam . . . a unique steam joint eliminates all thrust bearings.

Louisville Dryers are safe, automatic and economical. They require a minimum of labor, supervision and maintenance . . . and are carefully built for years of dependable service.

Write for new treatise on rotary dryers. Or call in a Louisville engineer. Have him look over your drying operation. Possibly a "predetermined", job-fitted Louisville Dryer can turn a losing operation into a profit maker.

Ask for new treatise on subject of rotary dryers

Other General American Equipment:

Turbo-Mixers, Evaporators, Dewaterers, Towers, Tanks, Bins, Filters, Pressure Vessels

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Louisville Drying Machinery Unit

Over 50 years of creative drying engineering

GENERAL AMERICAN TRANSPORTATION CORPORATION

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General Offices: 135 South La Salle Street, Chicago 90, Illinois
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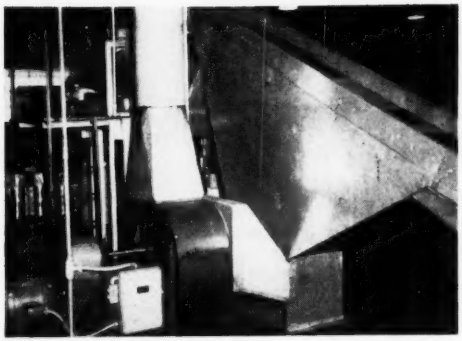
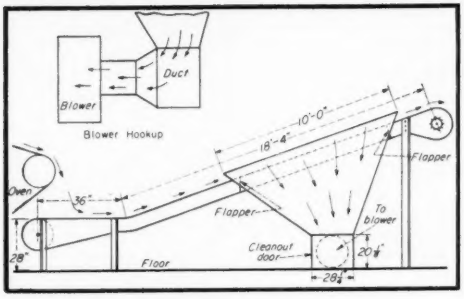
In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario





In-Transit Cooling Saves Space

Vital floor space was saved and packaging improved at our Cranford, N. J., coconut plant when a system was installed to cool the product while it traveled from dryer to packaging machines.

During one of the final processing steps, the sweetened coconut goes to a Proctor & Swartz dryer. Discharge from this unit is via an elevated conveyor (photo) made of 4¼ in. x 18 in. steel plates of 20 gage, perforated with .003 in. holes.

But the 280 deg. F. exit temperature of the toasted coconut is too high for packing in bulk containers. And so, to reduce the temperature of the product, a section of the conveyor was enclosed with steel plates to form a triangular duct (see drawing).

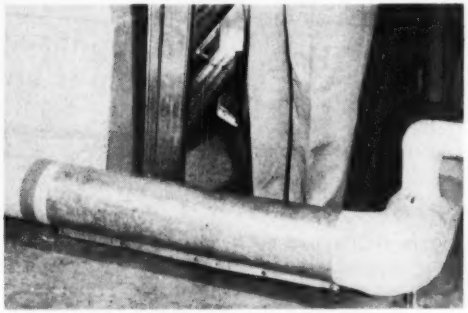
The small end of the duct terminates in a pipe that leads to a 30 in. Bishop & Babcock exhausting fan, designed for 5,950 cfm. at 2,460 rpm., against 5 in. static pressure, with a 3,200 fpm. outlet speed.

Top of the duct is open. When the blower is operating, air from the plant is drawn through the bed of hot coconut as it is conveyed from the dryer to a shaker screen and thence to the packaging lines. Exhaust air from the blower is piped to the outside of the building, where it enters a homemade cyclone for separation of the fines carried over with the air exhausted from the blower.

The two sides of the duct which are under the conveyor could only be extended up to the lower belt of the conveyor. That left space between the two belts for air passage to the blower, but not through the coconut. This air loss was overcome by placing flippers between the belts with just enough clearance to prevent interference with conveyor operation.

The length of travel over the duct is short, yet the temperature of the coconut is reduced approximately 100 deg. F.

This cooling operation was designed to handle approximately 650 lb. of product per hour. However, 1,200 lb. have been handled, though the average is around 900 lb.—*R. J. Boddington, Plant Manager, Wood & Selick, Sweetened Coconut Co., Inc., New York City.*



Metal Sheathing Protects Insulation

A very worth while protective-maintenance move is to bolt or tack-weld a sheet-iron jacket around pipe insulation in locations where objects may knock against it.

Material and labor replacement costs are thus avoided, as well as heat loss.

Where pipes cross passage ways and are near the floor, their insulation is extremely vulnerable. And if chains hanging from overhead valves can swing or rub against them, the chances of damage are greater. It is at such danger locations that a metal jacket quickly pays for itself.

Where required, expansion joints with spring-loaded bolts may be provided in the jacket to compensate for circumferential expansion. Lengthwise expansion is permitted by lap seams at intervals of approximately 12 ft.—*The Magnesia Insulation Manufacturers Assn.*

$50 EXTRA FOR BEST ITEM

You are invited to submit Practical Ideas. You will be paid at regular rates when your item is printed and if it is judged best for the month you will get an additional payment of $50.

Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and author's name will be cited (see below).

Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

Send your items to: Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

DECEMBER PRACTICAL IDEA voted best was "Accurate Shop-Made Volume Filler," submitted by L. C. Pagel, Technical Director, Red Dot Foods, Inc., Madison, Wis. It told how a special cylinder incorporating an adjustable product-pocket has been fitted on a company filling hopper to assure proper netweights of bagged popcorn.

We have been asked:

"How would you insulate a cold air duct while a 35° room is under refrigeration?"

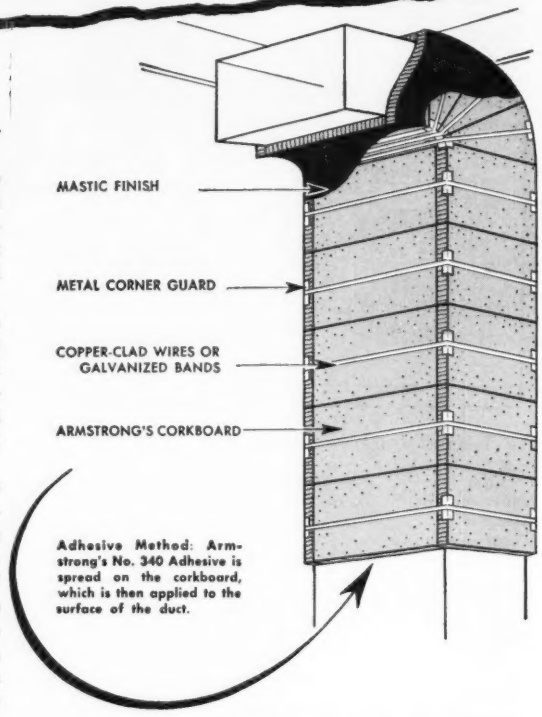
We recently received a letter that asked the following question:
"A duct which runs through one of our 35° storage rooms carries cold air at a temperature below the dew point of the room. We are troubled with condensation on the duct and would like to insulate it without taking the room out of service. How would you insulate and finish this duct?"

To answer this question we sent the specification illustrated at the right. It shows the adhesive method of applying Armstrong's Corkboard to cold air ducts. After the duct has been cleaned, Armstrong's No. 340 Cement is spread on the corkboard with a notched trowel, and the insulation is then applied to the duct.

Because the 35° temperature would stiffen the adhesive and make trowelling difficult, we suggested that it be applied outside the room. The corkboard could then be carried in and secured in place with copper clad wires or metal bands on 12" centers over metal corner guards. For ducts greater than 3' in any one dimension, metal bands should be used. Bands on the bottoms of ducts wider than 6' should be secured to metal fasteners attached to the center of the duct with a suitable adhesive. Sheet metal screws may also be used.

We also suggested, in this case, that the insulation be Armstrong's Mastic-Finish Corkboard. This product has an asphalt mastic finish ironed on at the factory and eliminates the need for applying a finish in the 35° room.

Whenever you're planning an insulation job, contact an Armstrong engineer. He has a thorough understanding of all phases of insulation work, and his practical advice takes into account every individual problem of the job at hand. In addition, Armstrong's Contracting Service will furnish you with top-quality materials and the skilled workmen to apply them properly. Just call your near-by Armstrong office.

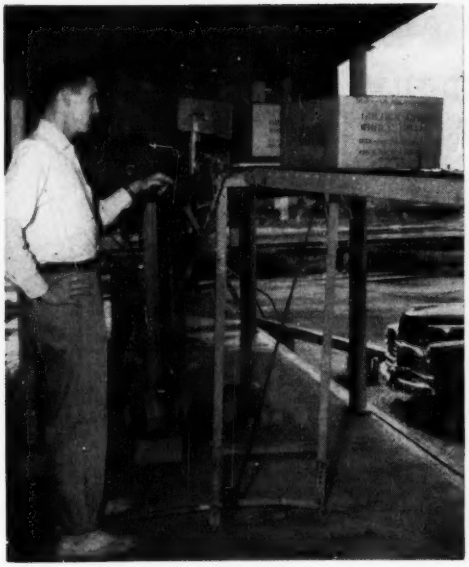

MASTIC FINISH
METAL CORNER GUARD
COPPER-CLAD WIRES OR GALVANIZED BANDS
ARMSTRONG'S CORKBOARD
Adhesive Method: Armstrong's No. 340 Adhesive is spread on the corkboard, which is then applied to the surface of the duct.

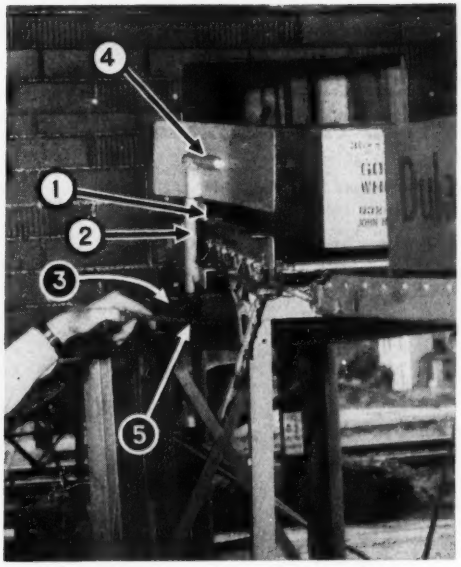
SEND US YOUR QUESTIONS. If you have any questions on insulating materials or their use in low-temperature installations, please write us. We'll see that you get a prompt, practical answer. Address your letter or post card to Armstrong Cork Company, 2302 Concord St., Lancaster, Pennsylvania.

ARMSTRONG'S INDUSTRIAL INSULATIONS

MATERIALS - INSTALLATION

FOR ALL TEMPERATURES FROM 300°F. BELOW ZERO TO 2800°F.





Stop Improves Conveyor Operation

Just a simple welded-together gadget has made the difference between congested and organized movement of case goods from our storage to the shipping platform.

Frozen food storage is on the second and third floors of our warehouse. Descent is by roller-spiral conveyors, from which cases discharge at considerable speed onto the conveyor entending across the loading dock.

Control at the exit from the spirals is necessary, to avoid congestion and mishaps. This was assured by installing a carton stop (photo left) which can be operated either by hand lever or by a foot pedal fastened to the base of the conveyor supports and connected through rope and pulley. The brake holds the cases on the spirals, wthout damage, until released.

Photo on the right shows how the rig was made: An angle iron 6 in. long was welded face out to the top of one side of the conveyor, several feet beyond the point where the spiral conveyor ends.—(1) in photo. A similar piece was welded on the bottom, opposite the first piece.

To the two faces, a length of pipe (2) was attached in a vertical position, to serve as sleeve or bearing for the shaft operating the stop.

On the shaft extending below the sleeve, the control lever (3) was welded. And on the upper end, the brake plate (4) was reinforced by a cross bar.

Correct shaping of the plate, which acts as the brake, is quite important. When the stop is held against a case, the plate must be flush with it for maximum friction, and also to prevent damaging it. Then, too, when the brake is released, it should not extend over the conveyor side to interfere with carton travel.

When conditions require, the control can be made remote. All that is necessary is to run a rope (5) from the operating lever through pulleys to the control location desired. A strong spring should then be attached to the lever arm to release the brake when the control rope is loosened.—*A. S. Pearson, Plant Engineer, John H. Dulany & Son, Inc., Exmore, Va.*

Big Value in White Strips on Floors

There is decided merit in painting an 18-in. white strip on all floors next to walls, and further establishing a plant regulation that such strips shall be kept free and unoccupied.

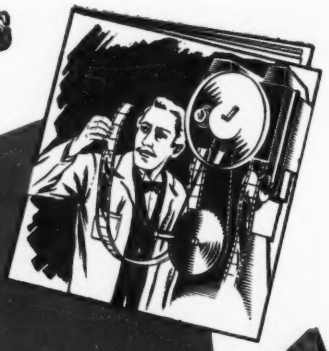
It is at the junction of walls and floors that litter most commonly accumulates—especially in "dead" spaces in warehouses where goods are stacked near to the walls.

Kept clear, the painted strips are readily observed throughout their length (with flashlight if necessary in dark locations). Thus, even slight objectionable accumulations are speedily revealed. Clean-up crews will be quick to spot litter on such strips, and proceed to keep them cleared and clean.

Improved plant cleanliness is but one advantage. Also, a ready check against insect infestation—nipping it right at the start—is afforded by the strips, particularly in those areas beneath windows. Insects fly to the light, and almost

BACK IN THE 1880's

WHEN THE INVENTION OF CELLULOID FILM PAVED THE WAY FOR MOTION PICTURES



Koven

WAS MAKING INDIVIDUALIZED FOOD EQUIPMENT

72" dia. x 20" Long Horizontal Tank

Aluminum Steel Tanks and Condenser

Even before curious Americans were witnessing the first silent saga—KOVEN was playing a vital role in the Food Industry. Today—leaders in steel fabrication—KOVEN utilizes over 70 years of experience to tailor Individualized Food Equipment geared to achieve production goals and net greater profit. Call or write for a consultation—no obligation.

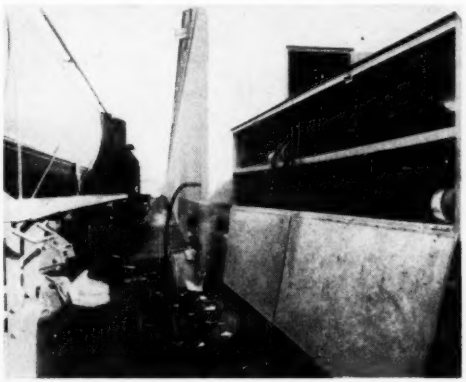
Our complete modern facilities include: machine, sheet and plate, welding and galvanizing shops, X-ray equipment and stress-relieving furnace. Among the many KOVEN products in all commercial and non-corrosive metals: Stainless Steel; Aluminum Sheet Fabrication; Boxes, Tote, Waste Cans; Chemical Apparatus; Coils and Pipe Bands; Copper Sheet Fabrication; Galvanizing Work; Mixers, All Kinds; Monel Metal Fabricators; Pails, Special Heavy; Pans, All Types, All Metals; Sinks, Scullery and Factory; Tables, Galvanized or Monel; Tanks, All Types, All Metals; Kettles, All Types, All Metals. Fabrication to A.S.M.E. Code Par. U-68 and U-69 a specialty.

L. O. KOVEN & BRO., INC.
154 Ogden Avenue
Jersey City 7, N.J.

Plants:
Jersey City, N. J.
Dover, N. J.

KOVEN FOR INDIVIDUALIZED FOOD EQUIPMENT SINCE 1881

without exception end their life at windows. And dead moths on white strips are almost as visible as a red flag.—*FE Staff.*



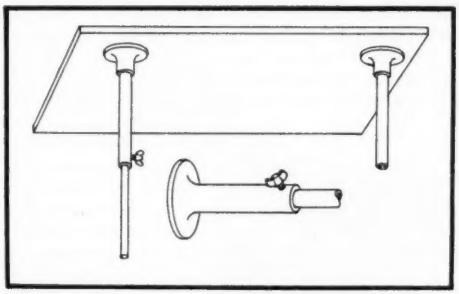
Box for Tank-Car Accessories

A metal locker for accessories, installed convenient to our tank-car unloading station, has paid for itself many times, saving both time and labor. Thus carefully maintained, the tank-car unloading equipment wears out less rapidly, and property loss is virtually eliminated.

Formerly, pipe attachments, hose, tools, and the like were carried from the plant when a tank car was unloaded. And they had to be lifted over a railing and lowered to track level. When the car was empty, all equipment was then returned to the plant (which they cluttered) via the same route—except those items overlooked.

With our new galvanized-iron locker housing all the accessories, these troubles are over. The unit is built long enough to hold any of the heavy lengths of hose. Lifting them in and out of the locker is much easier than dragging them back and forth over the railing.

Storing equipment, and locking the box, are responsibilities of operator who unloads cars.—*D. Bradshaw, Plant Engineer, H. A. Johnson Co., Boston.*



Adjustable Legs End Table Tetering

Work-table legs fabricated from two lengths of telescoping pipe (see sketch) are readily adjustable for leveling the work surfaces, thus preventing teetering and wobbling regardless of floor irregularities. Furthermore, legs so constructed permit raising and lowering the height of work surfaces to the most efficient operation heights.

The Practical Idea, "Correct That Wobble and Teeter" (Dec. 1950 *Food Industries*) described a satisfactory way to end the wobble of a permanently located structure. The method we have developed not only permits both leveling and adapting to desired height, but permits relocation of working-surface equipment without the need of a permanent type of leg and adjustment.

To construct the legs, first weld, bolt, or anchor with lag screws 1¼-in. threaded flange-footings to the underneath side of the table at leg locations. Then, into each of these screw 1¼ in. pipes. Length should be about 2½ in. longer than half the desired height of the table.

Next, over holes drilled or torch-cut in the pipes (about 2 in. above the lower ends) threaded nuts are welded. Now insert into each 1¼ in. pipe leg a piece of 1 in. pipe about the same length as the former, and secure in place by tightening on bolts threaded into the nuts that were welded onto the 1¼ in. pipe.

Table legs are easily adjusted, by means of the bolts, to level the surface, remove a wobble, or raise or lower table height.—*W. Emery Hobbs, Cascade Food Products, Salem, Wash.*

Household Iron Nips Packaging Bug

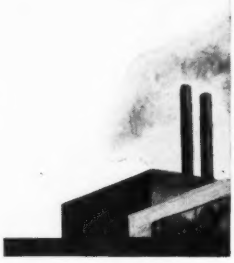
A simple electric flat-iron is now employed in our plant as a Nips means of sealing cellophane on wrapped bacon.

Prior to its use, we employed an electric roller for sealing bacon packages. But this, while fairly satisfactory, did not give us the smooth appearing package we desired. It had been a matter of much discussion as to how we could remove this "bug" in an otherwise first class packaging operation without prohibitive cost.

The answer came to me one day while watching my wife use her electric flat-iron to seal cellophane bags going into our home freezer. It appeared to be the perfect answer to our needs, especially as it was a tool most women use with considerable dexterity.

We adopted it. And this hand-iron sealing has worked out admirably for our purpose. We now use this method for sealing thousands of packages of tray pack bacon daily. Without any increase in labor, we are now producing a package that is neater, firmer, smoother and tighter than before. And our female operators prefer using the householdhold iron, with which they have been so long familiar. Further, our maintenance costs for the operation have been reduced to almost zero.—*S. M. Cook, Foreman, Memphis Packing Co. (Div. of Armour and Company), Memphis 2.*

What's the biggest concentration headache you've got?



Pass it along to us. We think we can help you lick it.

Many industries have come to Carrier with problems involving low temperature refrigeration. And together we worked out applications that improved both the process and the product. Often the process called for the evaporation of water from food products, or of solvents from chemicals, where temperatures of process or product were critical.

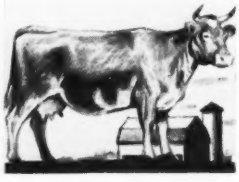
We bring this up to remind you that Carrier's experience in industrial refrigeration has been close and varied.

And, of course, Carrier's experience in the heat transfer business has paced the field for years.

So it was natural for these combined skills to bring us into the evaporation and concentration business.

Carrier experts in refrigeration and heat transfer, together with engineers long experienced in evaporator design, developed the new Carrier Concentrators.

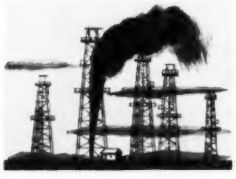
The Carrier Concentrator is a high vacuum, low temperature unit. It puts Carrier skill and experience to work in the concentration of products for the juice, milk and food industries . . . the pharmaceutical, chemical and petroleum industries . . . along with many others.



Doesn't it make sense to bring your concentration problem to experts who have a solid background in evaporation

Carrier AIR CONDITIONING

and concentration both, as well as in other processes within your industry? We think it does.



Maybe you have an immediate problem the Carrier Concentrator can solve. Maybe you just want to find out how it fits into the job you're doing. Either way, why not write us?

• • •

THE CARRIER CONCENTRATOR *is best because:*

It gives you your choice of one, two or three effect evaporation together with either a centrifugal, reciprocating or an absorption refrigeration cycle — whichever combination best balances your investment and volume.

Its low pressure construction and low film temperature cut operating costs and clean-up time, keep insurance rates and fabrication costs low.

Its packaged refrigeration cycle needs no refrigerant piping.

Its refrigeration cycle is separate from your evaporation plant: you can put it where it best fits in with the rest of your installation.

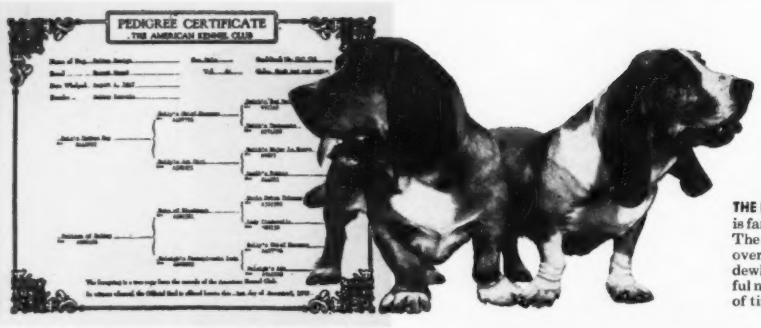
Where necessary, stainless steel is used on all parts in contact with the product.

You can sterilize the equipment either chemically or by steam, whichever your product may require.

And there are many other features which combine to give you the lowest possible first and operating costs plus the highest possible quality of product.

We'd like to send you additional information. Write us. Carrier Corporation, Syracuse 1, New York.

REFRIGERATION INDUSTRIAL EQUIPMENT



THE BASSET HOUND, a hunting dog, is famous for his keenness of scent. The ears are long enough to fold over the tip of the nose and heavy dewlaps hang from a short powerful neck. The short legs are capable of tireless action.

"Pedigree" is a Fancy Name for "Quality" . . . in Bassets or in Boxes

AND in both cases, it's earned by knowing and controlling every step in development, right up to the finished article.

UNION traces the ancestry of its corrugated containers all the way back to Union-owned forests . . . controlled through every step of manufacture in Union mills (largest in the world) and right up to the shipping of Union boxes to your plant.

That earns a pedigree for Union boxes, because you *know* you can depend on every shipment being up to the same high standards. You can reduce breakage, pilferage, returns.

Union Carbide and Carbon agrees, and ships its nationally known Prestone Anti-Freeze all over America in Union's *pedigreed* boxes—just as hundreds of other famous firms do.

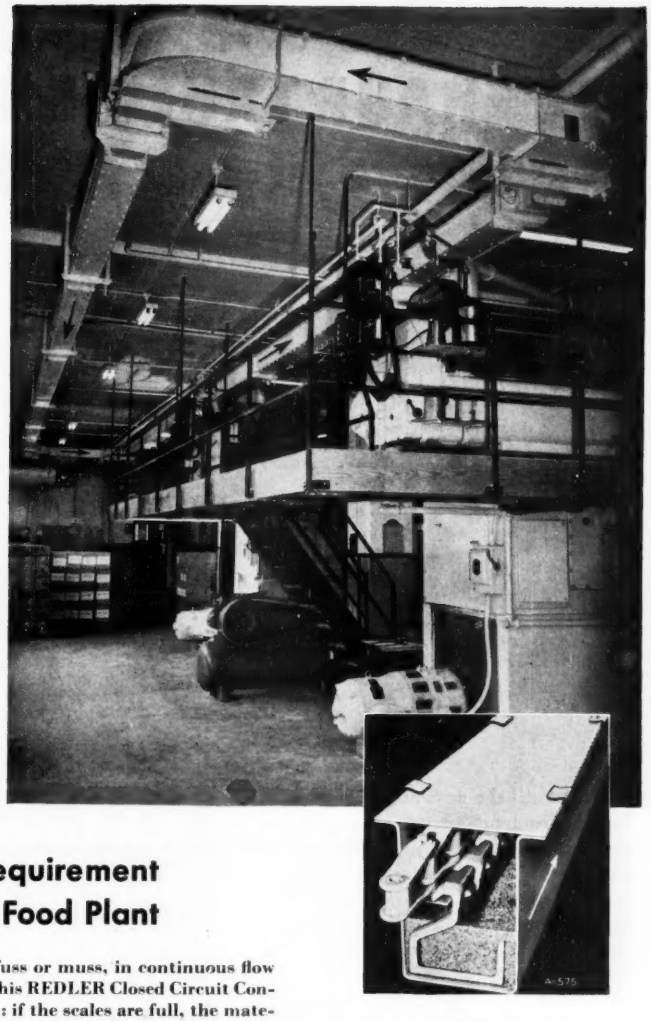
Dependable Packaging Since 1872

UNION Corrugated Containers

UNION BAG & Paper Corporation

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

***Corrugated Container Plants:* SAVANNAH, GEORGIA • CHICAGO, ILLINOIS • TRENTON, NEW JERSEY**



"Keep It Clean and Keep It Moving"...

Was the Handling Requirement in this Food Plant

Carrying semolina and farina without fuss or muss, in continuous flow to automatic weigh scales is the task of this REDLER Closed Circuit Conveyor. An unusual part of the job is this: if the scales are full, the materials can re-circulate in the conveyor until the scales are ready to receive. The whole operation must be constant. S-A engineers recommended, designed and installed a space-saving REDLER Conveyer that is meeting all requirements and insuring contamination-free ingredients.

Solving bulk materials handling problems for greatest economy and efficiency has been the achievement of S-A engineers for 50 years. They have a background of specialized know-how that can be invaluable in applying the *right* answer to your bulk handling needs. And they can draw upon a line that includes *every* type of bulk handling equipment.

Write for a free survey by an S-A engineer. No cost or obligation to you.

1901-1951

50 years experience with bulk handling

STEPHEN S-A ADAMSON MFG. CO.

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C. F. MUELLER CO.
Jersey City, N. J.

The REDLER Closed-Circuit Conveyor is mounted under the ceiling. By chute from the floor above, it receives semolina flour and farina used in making spaghetti and macaroni. Materials are conveyed around to and discharged into automatic weigh scales above the presses (right center). Arrows indicate direction of flow. If the scales are full, discharge gates are closed and materials may be re-circulated in the conveyor until the scales are ready to receive. This is a feature not available on any other type of conveyor. Inset shows cross-section of fully enclosed, dust-tight casing and details of side-pull chain and skeleton flights that constitute the conveying element.

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

Chances are 500 to 1 there's a FRUEHAUF TRUCK BODY already designed to fit your special needs, too!

COUNT all the advantages of buying a Fruehauf before you consider any other Truck Body. 1) Custom-fitted to your job over 500 ways—in body options alone. 2) All-steel "Unit-Built" like Fruehauf's rugged Aerovan Trailers. 3) Wheelhousing and straight-frame models . . . in all popular lengths. 4) Fast assembly, mounting and painting service at 80 Branches coast-to-coast. 5) Custom-built quality . . . production-line prices.

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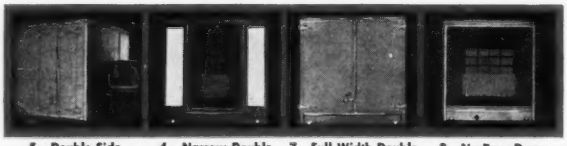
FRUEHAUF
Truck Bodies

Only Fruehauf *"Unit-Built"* Bodies Offer All These Options . . .

1. Open Top
2. Solid Rear End
3. Solid Sides
4. Single Side Door



5. Double Side Door
6. Narrow Double Rear Doors
7. Full-Width Double Rear Doors
8. No Rear Door

9. Express Gate Rear
10. Tailgate (Outside Type)
11. Tailgate (Flush Type)
12. Tailgate (Doors Above)

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Bag of Sylvania MS-3 in the 300 gauge retards drying of English muffins . . . keeps the product fresher . . . longer.

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LOOK AT THE BULL O' THE WOODS GO, NOW THAT HE'S GOT A GREEN LIGHT FROM UPSTAIRS! HE'S BEEN ITCHING TO CLEAN THAT JUNK OUT OF HERE FOR YEARS!
YEAH, HE WELCOMED THAT SCRAP REPRESENTATIVE LIKE A LONG LOST BROTHER! HAD TONS OF OLD MACHINERY AND BROKEN PARTS LINED UP BEFORE THE GUY EVER GOT HERE!
TODAY IT'S JUNK -- TOMORROW IT KEEPS A MILL FROM SHUTTIN' DOWN! MAYBE KEEPS US FROM SHUTTIN' DOWN, TOO... WHO KNOWS?
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J.R.WILLIAMS

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It's a hunt for scrap metal of all kinds desperately needed to keep production of everything for defense and civilian needs at peak levels. Some 9,000 steel salesmen working with local Chambers of Commerce Committees are calling personally on every business establishment where there is a possibility of locating metal not now being used. (For example:—a small button works scrapped 20 tons of obsolete machinery.) The businessman is then requested to sell his old steel or iron or copper or aluminum to a local scrap dealer who will sort, prepare, and resell it to the mills and foundries. *Help your local scrap representative when he calls,* or if he has already called on you *keep looking for scrap.* Junk your worn-out and broken machines and equipment now! Then put in a call to your local scrap dealer!

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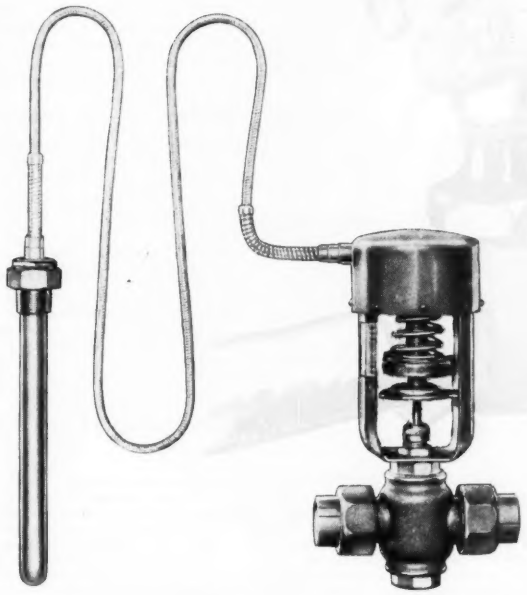

...for efficient, economical process control

● An automatic Sylphon Control can do a better job, any time, than hand-operated valves or "guess methods" do at governing temperatures. For Sylphon Controls maintain temperature that assures *uniform* processing conditions . . . *constant* product quality. They help reduce spoilage, wasteful overheating . . . save manpower and manhours. They do their jobs dependably—day in and day out.

Sylphon Temperature Regulator No. 999, pictured here, is one of the Sylphon line. Its outstanding features include stainless steel frame for minimum heat conduction from valve to regulator head . . . large size 2-ply Sylphon bellows for added power . . . less height and weight than other types. Self-operating—requires no auxiliary power source. Particularly suited for storage water heaters, metal plating tanks, bottle washers, treaters, slashers, etc.

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TRUCKS

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PAY LESS AT THE START

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Fact No. 2

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Chevrolet trucks give you Valve-in-Head economy that saves gas, four-way engine lubrication that reduces wear and saves oil, and tough, rugged construction for longer truck life. Like truck users everywhere, you'll find Chevrolet trucks cost less to own and maintain.

Fact No. 3

TRUCKS BUILT FOR YOUR PAYLOADS

Chevrolet trucks are *factory-matched* to meet your requirements. You get the right truck for the job . . . never "too much" or "too little" truck. Frame, axles, springs, body, brakes, and power form a *balanced team.*

Fact No. 4

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Records show that Chevrolet trucks traditionally bring more money at re-sale or trade-in than many other makes. Chevrolet's market value stays *up* because the value stays *in.* More reason to see your Chevrolet dealer for your best truck buy!

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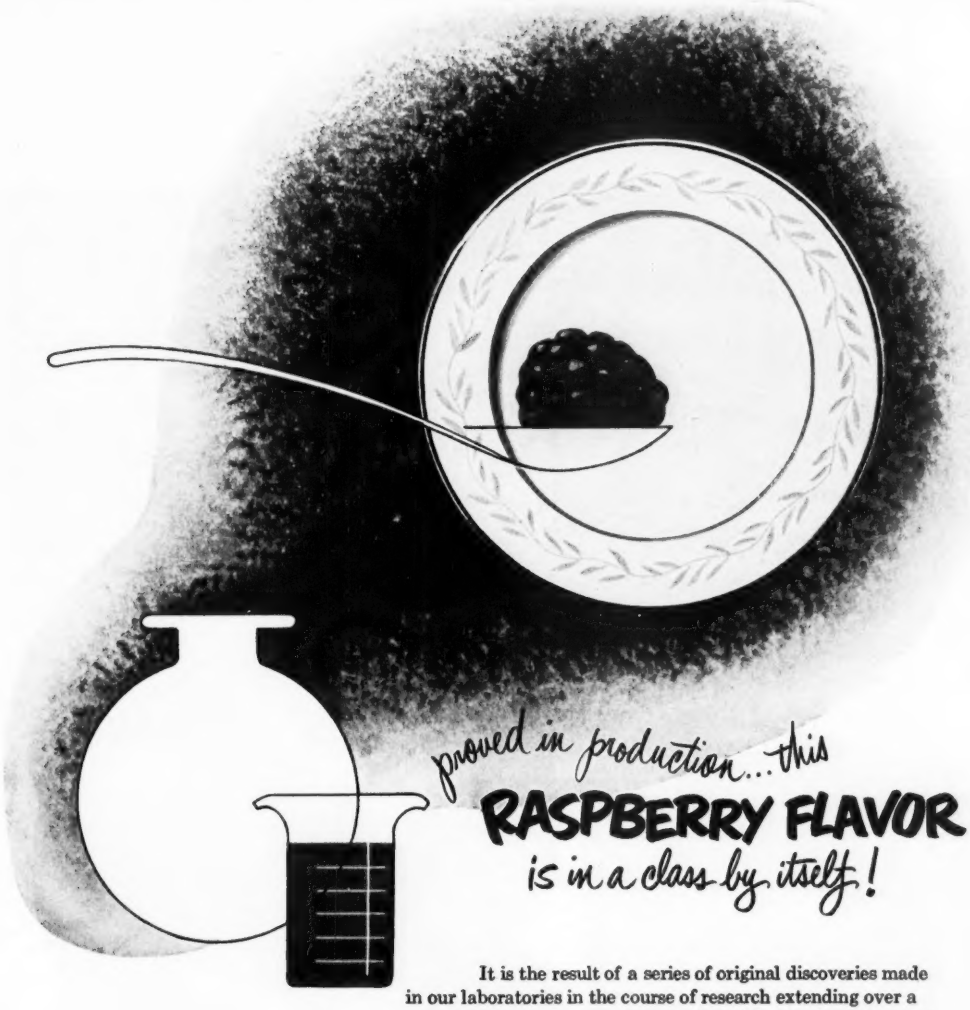

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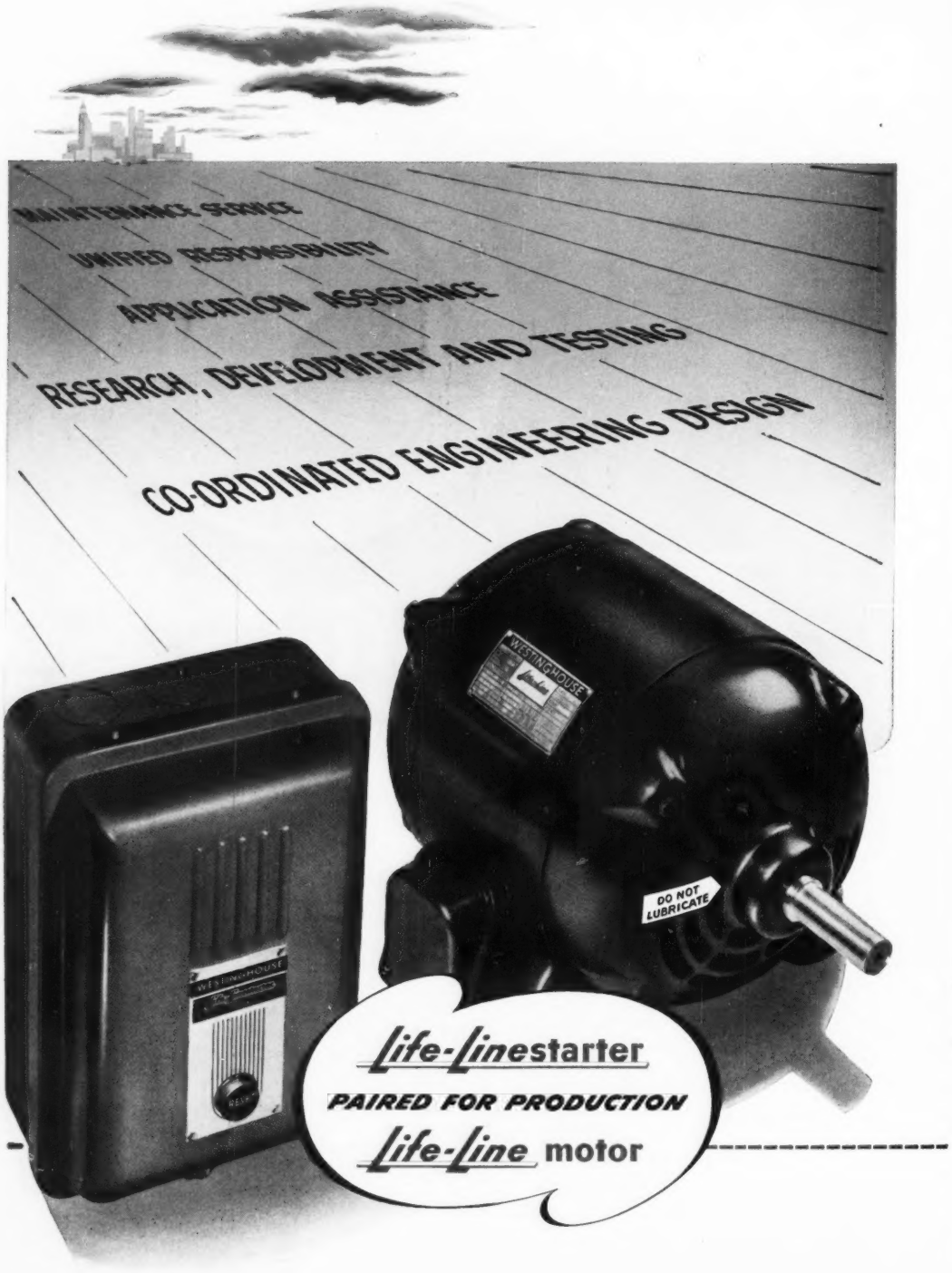
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You get more than a motor and a starter when you install these Life-Lines. You get complete design, engineering and service every step of the way.

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RESEARCH, DEVELOPMENT AND TESTING in Westinghouse laboratories result in such features as:

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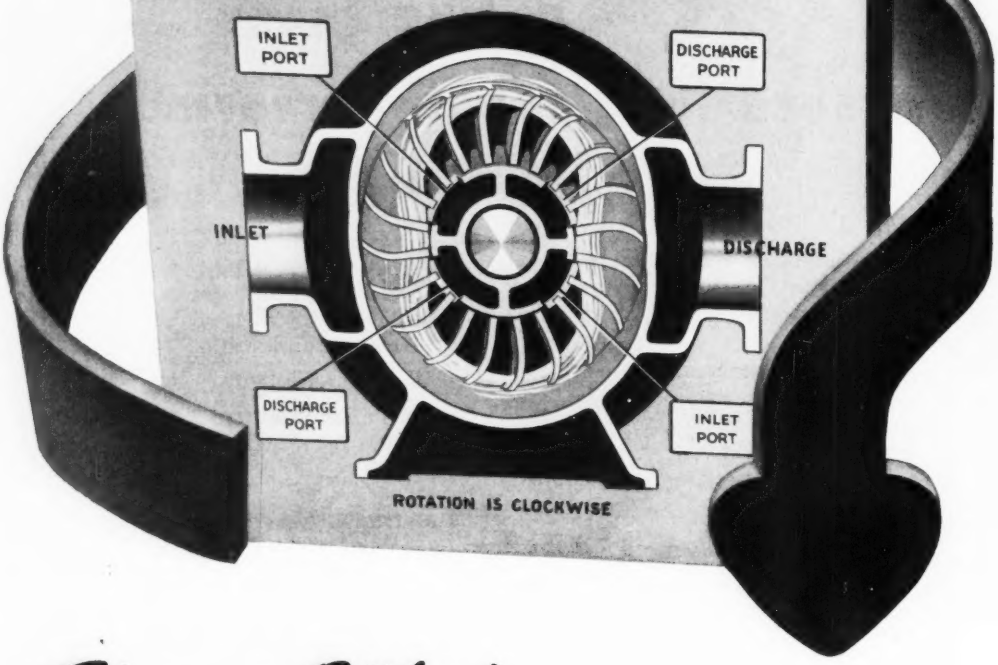
Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters



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You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

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No internal lubrication to contaminate air handled.
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No valves, pistons, or vanes.
Non-pulsating pressure.
Original performance constant over a long pump life.
Low maintenance cost.

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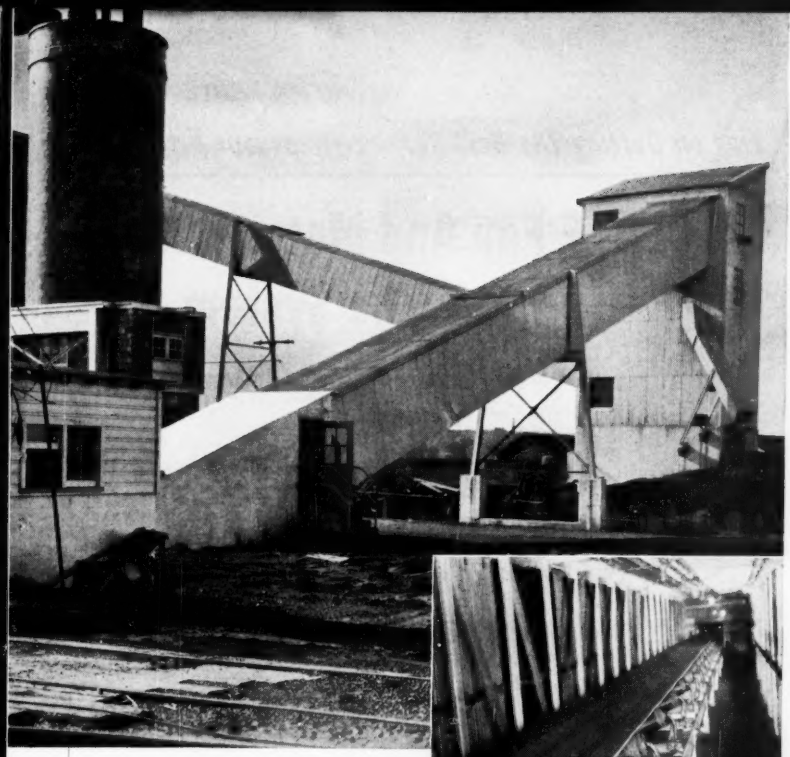
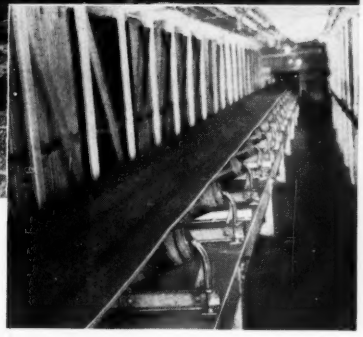




Starts fast at forty below...

This belt conveyor carries coal from railroad cars to overhead hoppers for a power company located in the northern part of the Midwest . . . so far north that temperatures frequently hit forty below zero. Starting the conveyor in that kind of weather meant lost time, wasted manpower. The bearing lubricant became so stiff that five or six men often were required to pull on the belt. Three hours a day frequently were lost in getting the unit in operation.

As many as a dozen conventional lubricants were tried without success before a change to STANOLITH Grease No. 42 was made on the recommendation of a Standard Oil lubrication specialist. None could match the ability of STANOLITH to provide easy starting at extreme low temperatures, and still maintain effective lubrication during high summer temperatures.

STANOLITH Greases are filling the bill in a wide range of industrial and processing applications because of their resistance to heat and to the washing action of water, and their ability to flow readily under wide variations in temperature. A Standard Oil lubrication specialist can help you take advantage of these special properties. A call to your local Standard Oil Company office is all that's necessary. Or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANOLITH
TRADE MARK
Greases

What's your problem?

Meet R. R. Rowlands, of Standard's La Crosse office. He is the lubrication specialist who worked with this power company to find the right grease for an especially tough job. And as a result of his work, the company was able to save considerable time in the operation of a coal conveyor.

His on-the-job service is typical of that available to all midwest plants through a corps of such lubrication specialists. You can be sure that the specialist in your own area has both the practical experience and the training in a Standard Oil Lubrication Engineering School that will result in dependable, thorough assistance.

Why not call your local Standard Oil Company office today? Put a lubrication specialist to work on your problem now. When he calls, be sure to discuss the advantages and performance records of these outstanding products:

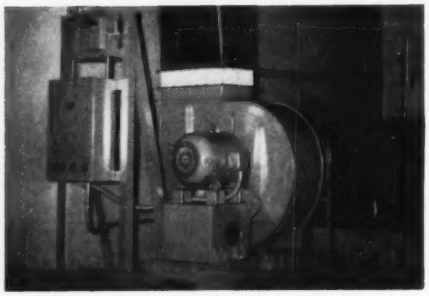
STANOIL Industrial Oils—This multi-purpose line of oils provides cleaner operation of hydraulic units, supplies effective lubrication in air compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of special oils and lubricants.

CALUMET Viscous Lubricants—These greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of open gears and chains, better internal lubrication of wire ropes.

STANDARD OIL COMPANY STANDARD *(Indiana)*

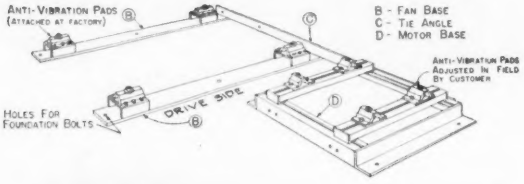
"Buffalo" *Tips on Getting the Best Service from your* **Fans**

ISOLATE Fan And Motor NOISE From The System



(1) With canvas duct-to-fan connections—

Today's correctly designed fan is a quiet running fan. However, any noise or vibration in the fan or motor can be transmitted throughout the ducts. Canvas or other flexible connecting material can isolate much of the noise at its source.

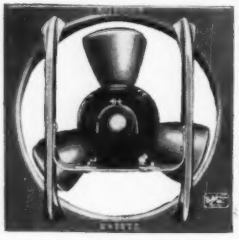

ANTI-VIBRATION PADS (ATTACHED AT FACTORY)
B - FAN BASE
C - TIE ANGLE
D - MOTOR BASE
ANTI-VIBRATION PADS ADJUSTED IN FIELD BY CUSTOMER
HOLES FOR FOUNDATION BOLTS
DRIVE SIDE

(2) With rubber insulation base →

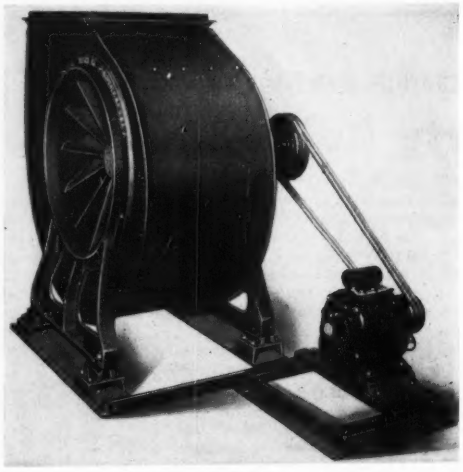
Another place to isolate any vibration or noise is at the fan base. At right, is shown the "Buffalo" Silent Floating Fan base adaptable to any arrangement of "Buffalo" Limit-Load Fan. Adjustable anti-vibration pads effectively insulate the fan from the foundation, as far as noise is concerned. "Buffalo" Limit-Load Fans are extremely quiet to start with, since all wheels are dynamically balanced at the factory for vibrationless operation. Also, "Buffalo" backward double curved blades, special scroll housing shape and inlet guide vanes, further reduce noise.

(3) Resilient-mounted motors

Where fans are direct-connected to the motor, there is more opportunity for vibration to be transmitted from motor to fan and vice versa. In all "Buffalo" disk fans like this BREEZO Fan shown, the motors are resilient-mounted and the wheels in balance. For further information on the question of fan or system noise, the "Buffalo" engineering staff will be happy to assist you.



"Buffalo" Breezo Fan, one of a complete line of propeller fans for low-cost local ventilation.



"Buffalo" Limit-Load Fan, with silent, floating base. Sizes available from 600 to 500,000 cfm. WRITE FOR BULLETIN 3737.

"Buffalo" FIRST FOR FANS

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Data courtesy Consolidated Lithographing Corp. Glen Cove and Voice Roads, Carle Place, Long Island.

DRESS THEM UP WITH COATINGS BASED ON VINYLITE *BRAND RESINS*

Labels coated with VINYLITE Brand Resins look brighter and cleaner because they *are* brighter and cleaner. The printing shines with a fresh, high gloss, proof against dirt and abrasion. In store or home, your label will always stand out, always look its best.

Coatings based on VINYLITE Brand Resins resist oil, alcohol, alkalies and most strong acids. They're flexible and tough—won't crack or peel—take a lot of handling and scuffing. Best of all, they transmit these qualities to whatever they cover—paper, cardboard, or foil.

Consequently, you can use them on packaging and display materials, too. They come in a wide range of easily cleaned, transparent and translucent colors. They won't affect folding endurance and are readily heat-sealable. Apply them with conventional roller-coating or spray equipment.

No wonder VINYLITE Resins are used in scores of products for defense and basic industry! Better look into coatings based on them now. For technical information and a list of suppliers, write Dept. LX-74.

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It's up to you to make every bit of stainless count—we're equipped to help you do it. When your problem is stainless—call on us.

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52 years of Fine steelmaking

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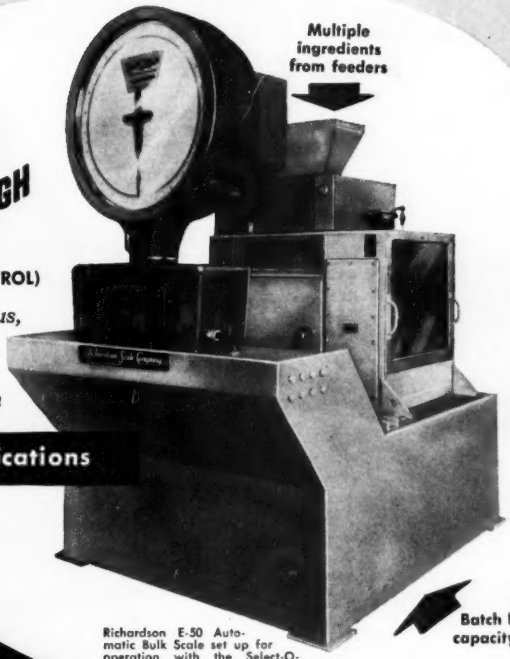
SELECT-O-WEIGH

(ELECTRONIC WEIGHT CONTROL)

Remote, Instantaneous, Dial-Control Formula Changing and Ingredient Selection

For *PROPORTIONING* Applications

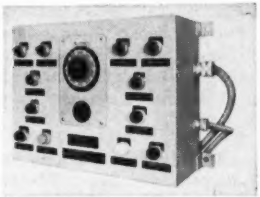


Richardson E-50 Automatic Bulk Scale set up for operation with the Select-O-Weigh. Discharge from E-50 would be through hopper to next operation on floor below.

Select-O-Weigh, Richardson's electronic weight control system, reduces the most complex formula-changing and ingredient-selection problem to push-button simplicity. For with Select-O-Weigh you select, measure, and deliver up to *twelve* ingredients from a single, pre-set, remote-automatic control panel.

Through incorporation of a simple, fool-proof electronic circuit, Select-O-Weigh changes formulas *instantly*, with the setting of a dial—no sliding poise adjustments or manual weight changing. And a single, automatic scale handles many ingredients—up to twelve or more.

Select-O-Weigh is designed for either cumulative or consecutive weighing, and can be used with many existing automatic scales.



Control panel for Select-O-Weigh handling constantly varying amounts of a single material. Weight desired is set on control dial, and compensation on smaller vernier knob below it. Multiple control dials for multiple ingredients.

The Richardson Scale Company, Clifton, N. J., will be glad to supply information on:

Feeder-Weigher Systems • Automatic Bulk Weighing Hopper Scales
Automatic Bagging Scales • Bag Sewing Conveyors • Packers
Process Control Panels and Select-O-Weigh

Please write direct to our Clifton office, or to the nearest of our branch offices, located in Atlanta, Boston, Detroit, Minneapolis, Cincinnati, Wichita, Montreal, Omaha, New York, Pittsburgh, San Francisco, Toronto, Buffalo, Chicago, Philadelphia, Houston.

Write for Select-O-Weigh Bulletin #0351.

Richardson

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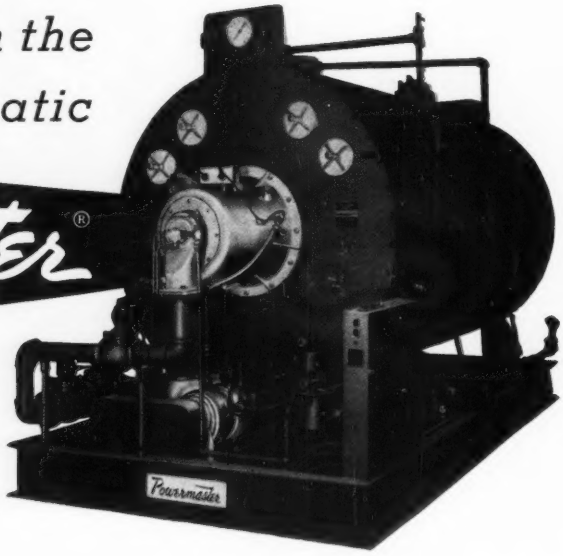
8300

now you can reduce steam costs with the automatic

Powermaster®



Model 3 *Powermaster*—15 to 500 H.P., high or low pressure models for steam or hot water.

Exclusive burner design (patent applied for) is yours with the *Powermaster* steam generator. Compare this unit with others and you'll see why users are saving hundreds of dollars on fuel bills. Only the *Powermaster* gives you these 3 definite ways to reduce your costs for steam or hot water—

1. *Use less fuel* when boiler operates between 100% and 30% of capacity. Special burner gives you full modulation in a wide range between high and low fire.

2. *Save clean-up time* and money because complete combustion of fuel gives practically smokeless and carbon-free operation. Case histories show that the *Powermaster* needs cleaning less often than other self-contained units.

3. *Change from oil to gas* (or gas to oil) in just a few minutes. Take advantage of low fuel rates, enjoy freedom from worry about fuel shortages.

Write for this catalog

that gives you the entire story of the *Powermaster* steam generator. Just ask for Catalog 1218 and we'll put one in the mail for you.

only the **Powermaster®** *gives you all 3 advantages*

Your Customers and Prospects

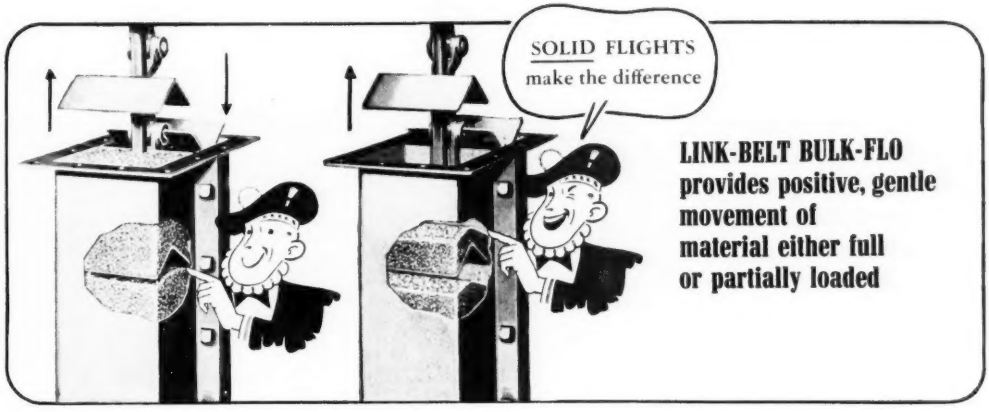
are reading this message. It tells why the Powermaster gives outstanding performance for

- LOW PRESSURE steam or hot water for heating
- HIGH PRESSURE steam for processing

We'll be glad to send you more information.

ORR & SEMBOWER, INC., *Established 1885*
940 Morgantown Road, Reading, Pennsylvania

Combined feeder · conveyor · elevator cuts your handling costs



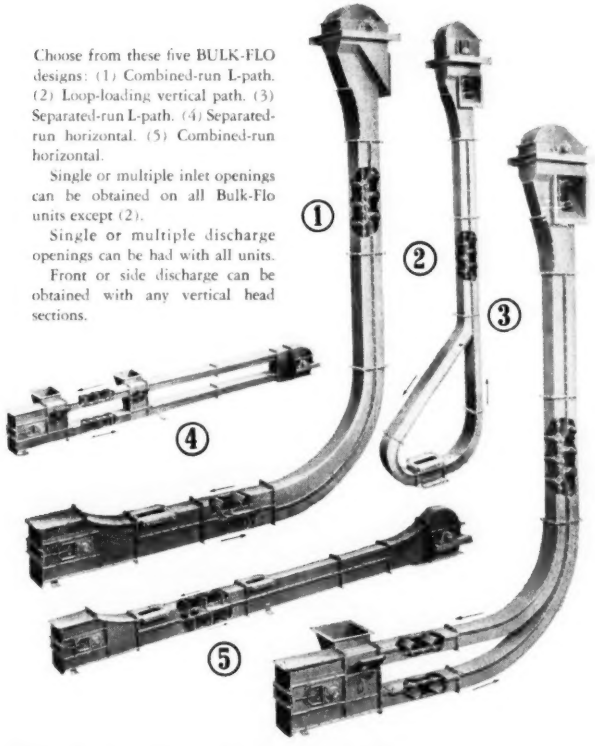
LINK-BELT BULK-FLO provides positive, gentle movement of material either full or partially loaded

Choose from these five BULK-FLO designs: (1) Combined-run L-path. (2) Loop-loading vertical path. (3) Separated-run L-path. (4) Separated-run horizontal. (5) Combined-run horizontal.

Single or multiple inlet openings can be obtained on all Bulk-Flo units except (2).

Single or multiple discharge openings can be had with all units.

Front or side discharge can be obtained with any vertical head sections.



BULK-FLO gives you true versatility in bulk materials handling . . . at lower cost. It replaces several units in less space . . . cuts initial outlay. And because *solid flights* operate independently of internal pressure, BULK-FLO can be operated at less than full capacity, with positive movement of materials.

That means capacity can be varied by regulating the feed. It also means gentler handling —material is protected in individual "compartments" to minimize degradation.

And note this—regardless of the amount of material being fed, BULK-FLO is self-clearing through intermediate runs. This feature allows you to alternate batches of different materials and prevents contamination.

You can get complete information on BULK-FLO from the Link-Belt office near you. Or write for your copy of Book 2175.

LINK-BELT

BULK-FLO
FEEDERS - CONVEYORS - ELEVATORS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in Principal Cities.
12,050

THE REGULAR WHITECAP

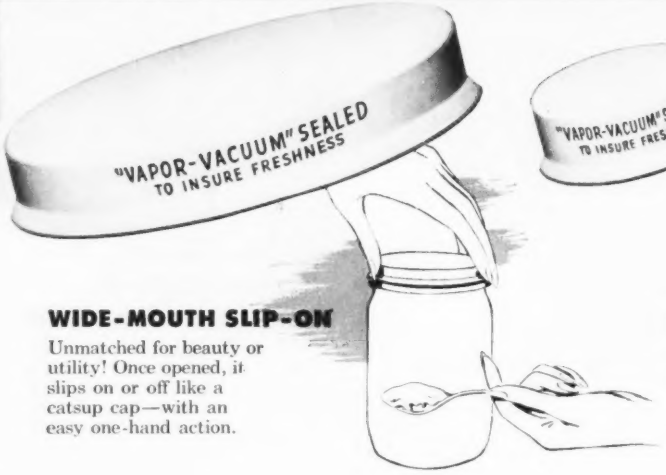
Basic cap of the Vapor-Vacuum line, with a range of use unequalled by any other closure. Now, as for many years, the most widely used of all pry-off caps.

SHALLOW WHITECAP

The new king of tumbler caps! All the advantages of Vapor-Vacuum side seal, plus a new flexibility which nullifies hook opener damage.

FOUNDATION STONE

The entire structure of America's billion dollar glassed food industry is built on the solid base of the *perfect protection, high speed,* and *low cost* made possible by these four famous caps!



WIDE-MOUTH SLIP-ON

Unmatched for beauty or utility! Once opened, it slips on or off like a catsup cap—with an easy one-hand action.

NARROW SLIP-ON

The closure that caps nearly all the nation's catsup and chili sauce . . . truly a great American institution.

For a change, let's talk specifically about CAPS. Vapor-Vacuum Caps, that is.

Two simple statements of fact give you the essence of the story of these famous closures:

1st, there's the big underlying idea which Vapor-Vacuum Caps stand for. These caps, plus the machinery which applies them, and the supplementary equipment and know-how which back them up, constitute a distinctive basic process, *unlike any other.*

Because of the vastly increased range of use which this method has given the packer, it is literally the foundation of the structure of modern glass packaging. Without it, the volume of foods in glass would never have reached its present levels.

2nd, there are the unusual qualities of the Vapor-Vacuum Caps themselves. There are only four Vapor-Vacuum Caps. But between them, these four similar closures have an amazing range. They can take care of the particular needs of *any food* that is to be packed in glass. They do this in a way which gives the consumer the utmost convenience and service *in the home.* And, above all, they assure levels of efficiency and economy *in the plant* which cannot be achieved any other way.

In the months immediately ahead, White Cap Company will present, in this space, specific facts about each of the 4 Vapor-Vacuum closures. Be on the lookout for these worthwhile presentations!

"VAPOR-VACUUM" Seal and Re-Seal

PRODUCT OF **WHITE CAP COMPANY** CHICAGO

A Star Quartet of Economical, Sales-Building Packages

for Your Products

Bemis Deltaseal®

—This long-time favorite has exclusive pull-cut-pour spout. Billboards your brand . . . and flat tops and bottoms help build excellent mass displays.

Bemis Deltaphane®

—If your trade prefers a window package, Bemis Deltaphane, with the "picture window," is your best bet. Your brand in crisp, bright colors on all four sides. Has the pull-cut-pour top, too.

Bemis Cellophane

—There's an increasing demand for the *show window* bags—Bemis Cellophane. Bemis' bright, eye-catching printing makes your brand shine like a headlight.

Bemis Flexi-Carton®

—Sturdy, gusseted bag, single-, 2- or 3-ply. A fine shelf package, with your brand printed on all sides. Closures: sewing, taping, stapling, pasting.

Here's another bonus for you . . . Bemis Deltaseal Packaging System *closes all of these types* of bags (except Flexi-Carton), so you can meet the varied demands of your trade. Deltaseal Packaging System is the most economical packaging operation for you . . . *proof on request.*

Bemis is also your best source for Burlap, Cotton, Multiwall, Paper and Waterproof Bags. Ask your Bemis Man for the complete story.

Bemis

THERE'S A BEMIS PLANT OR SALES OFFICE NEAR YOU—

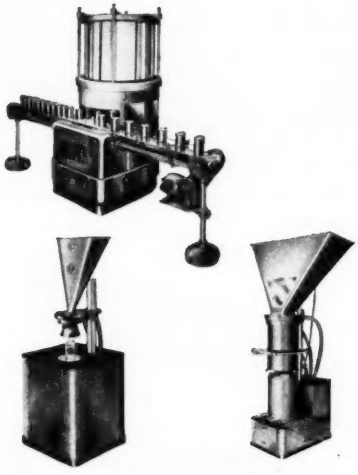
Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Cleveland Denver • Detroit • East Pepperell, Mass. • Houston • Indianapolis • Kansas City Jacksonville, Fla. • Los Angeles • Louisville • Memphis • Minneapolis • Mobile New Orleans • New York City • Norfolk • Oklahoma City • Omaha • Peoria Philadelphia • Phoenix • Pittsburgh • St. Louis • Salina • Salt Lake City • Seattle San Francisco • Vancouver, Wash. • Wichita • Wilmington, Calif.

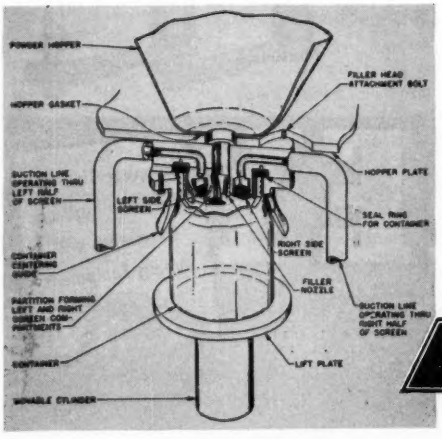
CLEAR THE AIR

with

VACUFLOW *Dustless* POWDER FILLERS

Cut Product Wastage
Obtain Accurate Uniform Fill
Cut Cleaning Costs





Pneumatic, a leading manufacturer in the packaging field since 1895, now offers a complete line of powder filling equipment — machines operating on a new principle of vacuum feeding, instead of pressure to pack the powder into its container.

Here's how Vacuflow works: Air is removed from the container to create a vacuum, which draws a measured quantity of powder from the hopper. Uniform fill is assured by regulating the powder's density with a predetermined degree of vacuum. This unique method eliminates dust because it simply does not involve air currents that *cause* dust.

Units are available to handle every powder filling requirement. This includes semi-automatic models for filling containers ranging from a tiny powder box up to 200 pound drums and multiple head rotary models for automatic handling of 5 pound sizes or less, at speeds of 45 to 300 per minute. Pneumatic invites your inquiry.

PNEUMATIC SCALE CORP., LTD., 91 Newport Avenue, Quincy 91, Massachusetts. Branch Offices in New York; Chicago; San Francisco; Los Angeles; Seattle.

PNEUMATIC
LOWER COST PER CONTAINER

PACKAGING AND BOTTLING MACHINERY

CHAINS and SPROCKETS

Jeffrey Chains and Sprockets are being put through the acid test of actual service on thousands of tough jobs . . . especially where the demand is for high-quality products. They are in universal use for unit machinery, for conveyors and bucket elevators, and for transmitting power. Follow the lead of those engineers who know the importance of "good chains and sprockets." Send for our new Catalog No. A-418 which goes into detail.

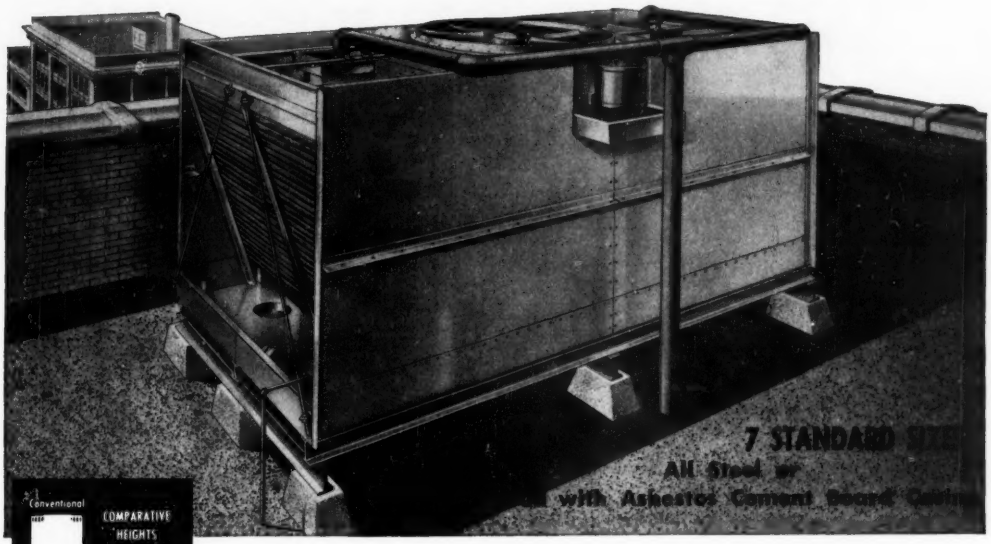
We show only a few types here but Jeffrey builds a complete line from which to choose.

THE JEFFREY MANUFACTURING COMPANY
927 North Fourth St., Columbus 16, Ohio
ESTABLISHED 1877

Complete Line of Material Handling, Processing and Mining Equipment

NEW DOUBLE-FLOW AQUATOWER

Marley Introduces Lowest Silhouette, Lowest Pumping Head Cooling Towers For Intermediate Capacities



New Simplicity • New Accessibility • New Efficiency

By combining the outstanding features of the large patented Double-Flow and the smaller Aquatower (both accepted leaders in their fields), Marley has produced the cooling tower that will set the standard in another size range . . . THE DOUBLE-FLOW AQUATOWER. Architects, engineers and contractors will be equally enthusiastic about this tower because it is highly efficient, lowest in height and harmonious with building design, and remarkably easy to erect.

The Double-Flow design means low tower height and low pumping head; efficient air utilization—one fan drawing air from two completely open sides—with consequent minimum fan horsepower requirement. Open distribution, "at-a-glance" inspection are features, as are minimum load concentration and economical grillage and support.

From the Aquatower comes simplicity . . . of construction, of piping, of operation. The nailless Redwood filling that is very easily installed or removed is another adaptation. All basin fixtures are readily at hand. Double-Flow Aquatower mechanical equipment is all designed, manufactured and guaranteed by Marley specifically for cooling tower usage . . . and it is all completely accessible.

You'll want complete details of this tower that will fit many installations in many industries, typical of which are those requiring 50 tons or more of refrigeration. Fill out the coupon below and you will receive it immediately.

Producers of
DOUBLE-FLOW TOWERS
AQUATOWERS
VAIRFLO TOWERS
CONVENTIONAL TOWERS
DRICOOLERS
NATURAL DRAFT TOWERS
SPRAY NOZZLES

MARLEY

The Marley Company, Inc.

222 West Gregory, Kansas City 5, Mo.

Send me your 8-page brochure on the new Marley DOUBLE-FLOW AQUATOWER.

Name_____

Firm_____

Address_____

City_____ State_____

"Gets clearer juice from press by using CELITE"

From a CELITE Field Engineer's report on jelly making

"IT TOOK only one trial run to convince this customer that he had a lot to gain by using Celite* Pressing Aids in making jelly from frozen grapes. Judging from the clarity of the jelly when Celite was used—a considerably longer storage life could be expected. And because of this clarity, the jelly had far more sales appeal."

• • •

Unusual clarity is one of several economic advantages that are causing more and more fruit processors to use Celite Pressing Aids. Faster production, clearer juice, higher yields, less wear and tear on cloths and equipment are some of the important benefits obtained when these diatomite powders are added in small amounts to the pulp before pressing.

HOW CELITE PRESSING AIDS WORK

The tiny Celite particles, open and porous in structure, interpose themselves between the particles of solid pulp matter. This opens up countless minute channels through which the juice can escape, freely and at lower pressure. More juice is thus extracted in less time. The drier cake is more easily removed and the cloths can usually be re-used without washing.

Celite Pressing Aids are used with practically all types of fruit products. No special equipment is needed and the benefits they assure will usually more than pay for the small amounts of powder required.

IF YOU FILTER

Celite Filter Aids can bring you corresponding benefits in faster production, sparklingly clear juices, longer filtration cycles. They are available in 9 grades of particle fineness, each designed for a specific filtering requirement. A Celite Engineer will be glad to give you all the facts.

*Reg. U. S. Pat. Off.

For further information, write Johns-Manville, Box 290, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

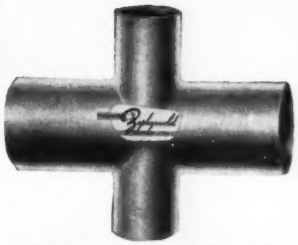
Johns-Manville CELITE

PRESSING AND FILTER AIDS

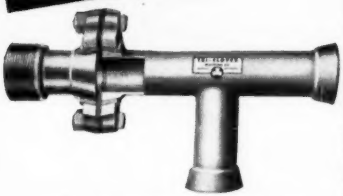
Try TRI-CLOVER

THE COMPLETE LINE

"ZEPHYRWELD"® WELDING FITTINGS . . . SS Type 304, 347 and 316—Inconel and other SS analyses. Fabricated in O.D. **Tube Size,** ½ in. thru 24 in.—ells, tees, adapters, etc. Covered in Catalog 748.

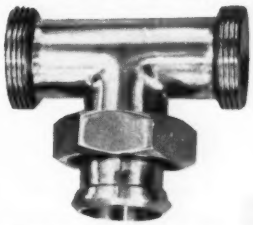


SCHEDULE 5S and 10S WELDING FITTINGS . . . "Zephyrweld" SS Type 304, 347 and 316, full range of sizes from ½ in. thru 24 in. **pipe,** for use with Stainless light gauge **pipe.** Covered in Catalog 1051.



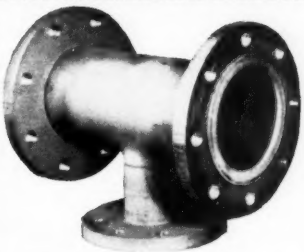
CONICAL END FITTINGS . . . Stainless Type 316 — Inconel and other SS analyses. Complete line, sizes from 1 in. thru 4 in. O.D. Features: Light weight — low cost — fast installation — leak-tight — easily adapted to other fitting types. Covered in Catalog 848.

RECESSED-END FITTINGS . . . Stainless Type 304-347-316. Low cost, light weight fittings for fast, simple soldering, brazing or socket welding. Sizes from ½ in. thru 24 in. Full line of elbows, tees, adapters, etc. Covered in Catalog 948.



SANITARY TYPE FITTINGS . . . Stainless Steel and Tri-Alloy (Nickel Alloy), from 1 in. thru 4 in. O.D., full range of fitting types. Approved as meeting 3A Standards throughout, incorporating exclusive design features. Covered in Catalog 150-S.

SCREWED FITTINGS . . . Stainless Steel Type 304-347-316. Complete range of fitting types. Meets the demand wherever flanged and screwed fittings are required. Clean-cut, accurate I.P.S. threads. Covered in Catalog 451.



PREFABRICATED FITTINGS . . . such as this butt-welded, flanged assembly, available in a wide range of types and sizes to meet special requirements.

STAINLESS STEEL TUBING AND PIPE . . . a most complete line, in all popular stainless analyses, wide size range, polished or unpolished.

INDUSTRIAL VALVES . . . Tri-Clover offers a wide selection of standard and special design valves in a wide range of types and sizes to meet practically every corrosion-resistant requirement.

NEW PUMP CATALOG 250 . . . contains **complete** pump data never before published — covers the full 1951 Tri-Clover Pump Line for every application. Write for your copy now.

Here you see representative fittings, valves, pumps, tubing and pipe that go to make up the *complete* Tri-Clover line—all available from *one* source. Install these stainless steel or alloy products in your process lines and realize the advantages of increased production and lower maintenance cost. 32 years of specialized experience in solving corrosion piping problems can be yours by consulting our engineers.

Write for details, or see your nearest Jobber.

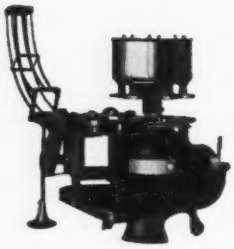
Tri-Clover MACHINE CO.

Kenosha Wisconsin

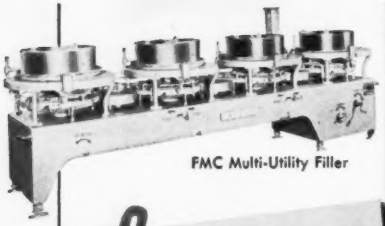
TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

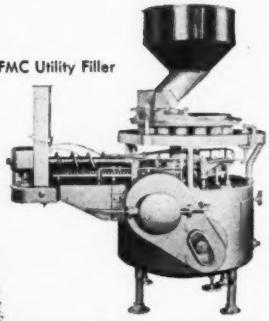
THE Complete LINE



FMC 6-Valve Juice and Pulp Filler

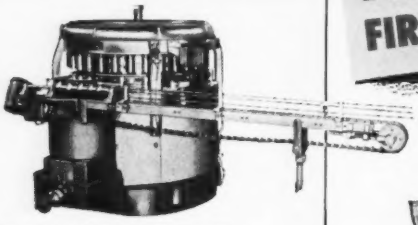


FMC Multi-Utility Filler

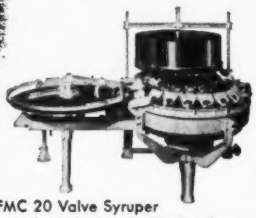


FMC Utility Filler

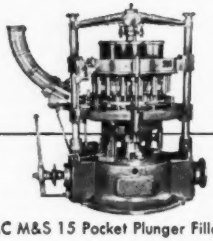
fmc
FIRST IN FILLERS



FMC M&S 30 Pocket Plunger Filler

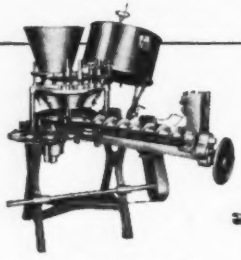


FMC 20 Valve Syruper
(with drainer & disc feed)



FMC M&S 15 Pocket Plunger Filler

FMC Hand Pack Filler



FMC 8 Station Pea & Bean Filler

FMC Model 15 Carton Filler

DEPENDABLE FILLERS OF EVERY TYPE FOR EVERY NEED

Through long experience in working with canners for the best solution of particular filling problems, FMC has developed and perfected a complete line of filling machines designed to—

- **Speed up and simplify operations.**
- **Eliminate waste and loss through accurate product fill.**
- **Increase capacity through greater flow-line efficiency.**
- **Produce maximum quality pack at reduced cost.**

The fillers shown above are typical of FMC's line of skillfully engineered machines. All have been thoroughly tested and proved to provide canners with the highest quality filling standards. Whether your requirements call for canning liquid, semi-liquid, whole or granular products, or for packaging frozen foods, there's a FMC Filler built to do the job more efficiently and economically.

Write for full information, or call your nearest FMC representative.

First in Diversified Food Equipment

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division

General Sales Offices:

WESTERN: SAN JOSE 6, CALIFORNIA

EASTERN: HOOPESTON, ILLINOIS

What are you doing about the third control?

• Frequently you give serious thought and attention to *pressure* and *temperature control.* This is quite natural because it means better operation and more production and often prevents damage. But what about the *third control—entrainment control.* Lack of this control can be just as costly as lack of pressure and temperature control.

Lack of the third control can mean shut downs and loss of production due to entrainment wear in engines and process equipment. Larger slugs of entrainment have been known to blow off cylinder heads of reciprocating engines and to ruin thrust bearings of turbines.

Lack of third control means poor efficiency of superheaters, steam ejectors, dryers and other equipment. It means dirty pipe lines and fouled valves.

End this damage *once and for all* with Hi-eF Purifiers. They remove 99% of all entrainment. Individually guaranteed, Hi-eF Purifiers are the most economical protection you can buy . . . they cost no more than an ordinary separator. Write us today about your entrainment problem. Let our engineering staff, without the slightest obligation, give you the proper solution.

PURIFIER DIVISION,

THE V. D. ANDERSON COMPANY

1995 West 96th Street • Cleveland 2, Ohio

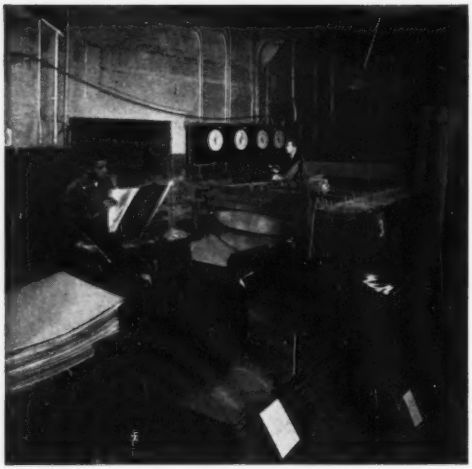
Gentlemen: Please send additional information on Anderson Hi-eF Purifiers.

Name_____

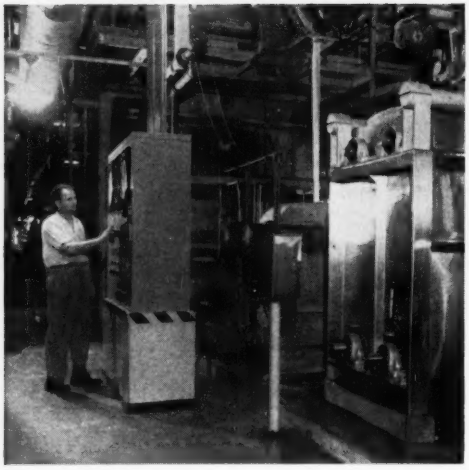
Company_____

Address_____

City_____ Zone___ State_____



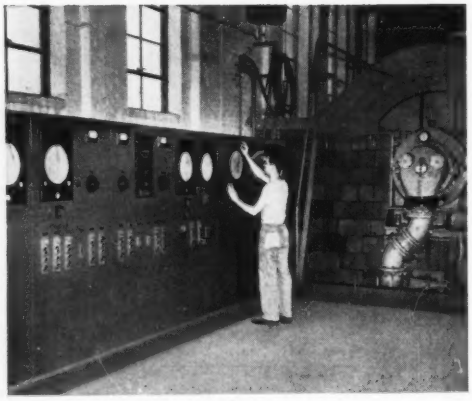
HOT DIP *tin house in large eastern steel mill uses* **ElectroniK** *instruments to control metal and palm oil temperatures . . . in adjacent departments, the same instruments control huge electrolytic tin lines, insuring quality tinplate and minimum use of the strategic metal.*



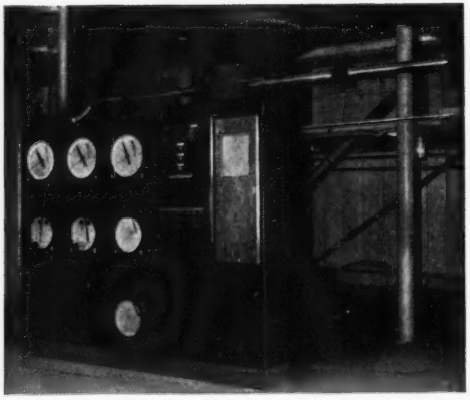
COORDINATION *of speeds, temperatures, pressures, flows and other variables . . . through modern instrumentation . . . makes possible the stabilization of continuous textile bleaching, and results in greater overall production in such a modern installation as this.*

For all of industry . . . *especially*

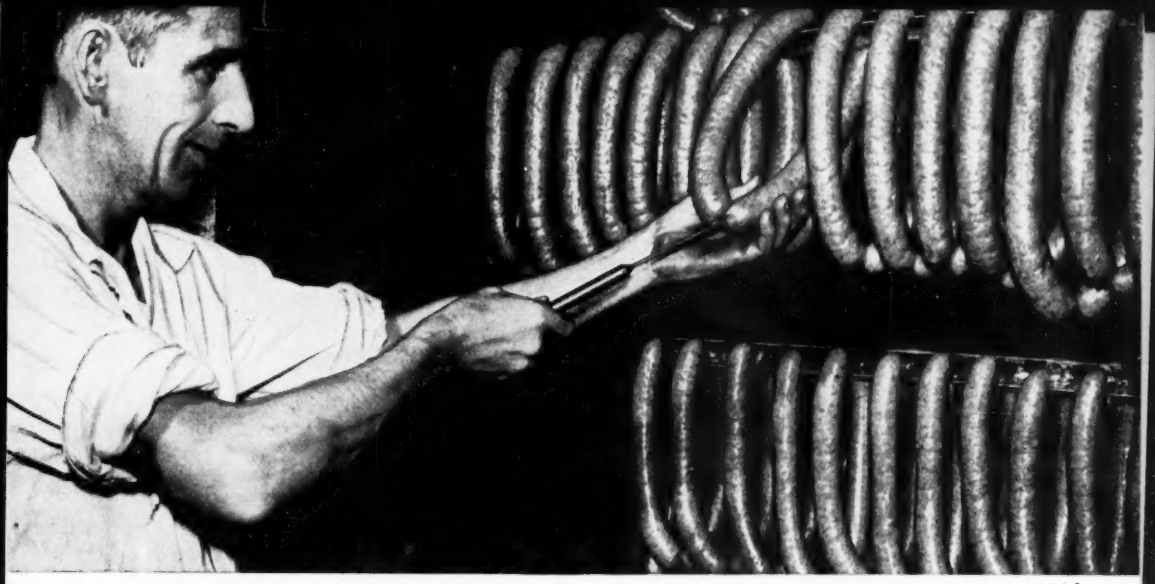
Instruments



ONE MAN BLEACH PLANT, *with the best equipment and controls, produces 130 tons of bleached pulp per day. The plant runs so smoothly that the operator also has time to make hourly tests on bleach liquor and bleached pulp.*



CITRUS CONCENTRATORS *at Pasco Packing Company plant turn out 1250 gallons of high quality concentrate per hour. One man supervises operations . . . aided by Honeywell automatic control system which regulates raw juice flow, heat input, and density of finished product.*



MEAT PACKERS *are boosting smokehouse output as much as 15% by measuring internal temperatures of meat products. A special thermocouple, used with an* **ElectroniK** *recorder, eliminates guesswork in judging completeness of cooking . . . saves labor, steam and fuel, and improves quality.*

for the food industry

speed production

A LOT of changes are being made in food plant engineering . . . and a lot of production-minded processors are turning to a new concept of control technology as a basic tool for the practical application of revolutionary process techniques.

Increased demands for more and more of the new food products will place greater emphasis upon the need for stepped-up production without compromise on quality or cost. And, modern instruments and controls are ready to handle an increasing share of the load.

Brown instruments and controls have earned the respect of progressive food plants . . . have become identified with such important new processes as aseptic canning, citrus juice concentration, and the packaging of fresh whole milk. Even now, more new developments are in the offing, incorporating newer techniques and newer controls.

Our local engineering representative will welcome the opportunity to discuss your instrument requirements . . . to speed production or accelerate research. Call him in today, he is as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Philadelphia 44, Pa.

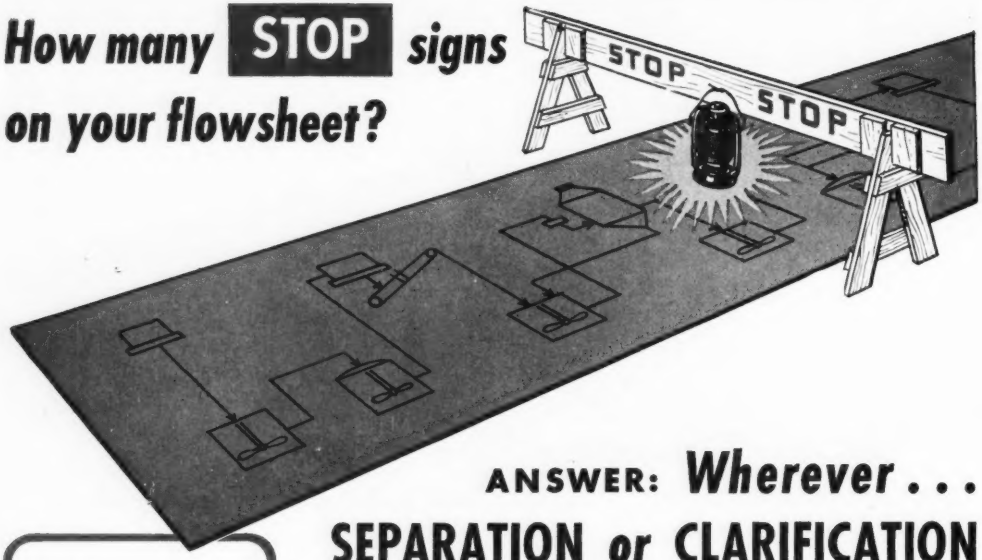
MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS

First in Controls

● *Important Reference Data*

Write for a copy of new brochure, "Tomorrow is Today". . . for a brief description of the manifold contributions of instruments.

How many STOP signs on your flowsheet?



ANSWER: *Wherever . . .*

SEPARATION *or* CLARIFICATION *is not* CONTINUOUS

De Laval centrifugal machines change interrupted processing to a continuous flow. Separation or clarification becomes an integral part of the total process, for centrifugal force can do in seconds work that gravity or some filters take minutes or hours to accomplish.

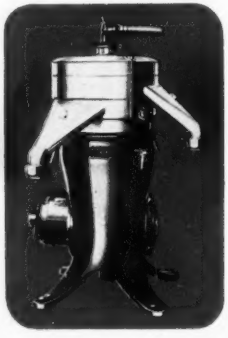
De Laval machines for such processing have three applications: (1) continuous separation of two liquids, (2) continuous clarification of one or two liquids and (3) continuous separation of two liquids plus the continuous removal of solids from one or both.

Each application requires its own type of centrifugal machine in the size and capacity that best fits the individual problem. A De Laval engineer will be glad to show you how the right machine may save you both time and money, and often improve the product as well.

Why DE LAVAL *is the choice*

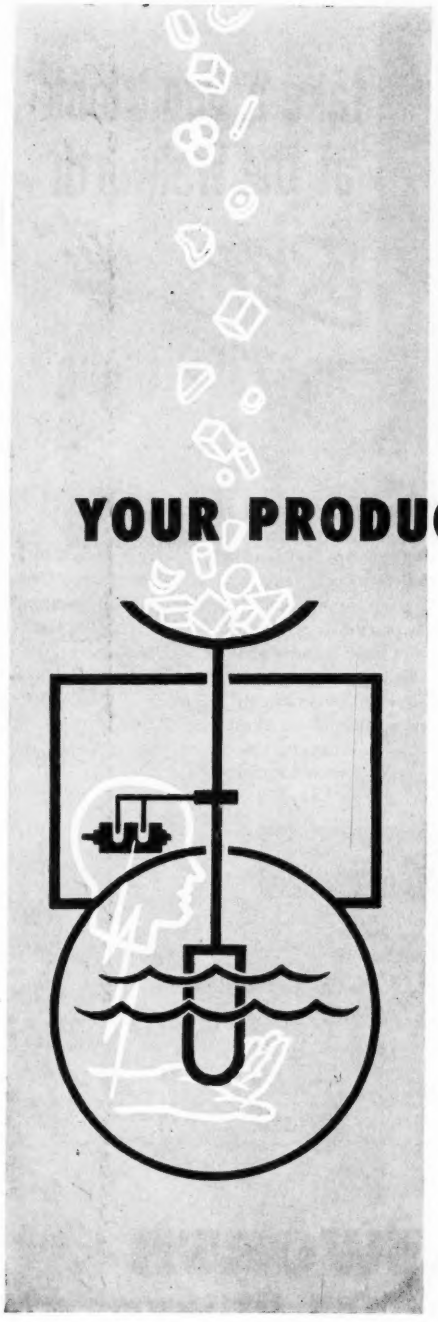
De Laval has over 70 years' experience in solving problems of separation and clarification. Your problem may be quite similar to one that has already been solved by De Laval centrifugals, and De Laval files are full of data that may be helpful to you. The result of using this stockpile of human experience and recorded facts may well be a distinct saving of time and improvement in your process.

THE DE LAVAL SEPARATOR COMPANY
Poughkeepsie, New York 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 5
THE DE LAVAL COMPANY, Limited, Peterborough, Ont.



Don't Tolerate "STOP and GO" Separation

LET *De Laval* MAKE IT CONTINUOUS



Candy

Crackers

Potato Chips
(and like products)

Cookies

Pretzels

YOUR PRODUCT MIGHT BE NEXT

Important improvements and cost-savings are being made in the weighing and filling operation on the packaging lines of several major industries.

Machines utilizing a new method of weighing are getting an accuracy at high speed previously unattainable. The new method is Hy-Tra-Lec, an exclusive development of America's pioneer packaging machinery manufacturer.

Hy-Tra-Lec harnesses the principles of "positive displacement". Unlike conventional weighers, there is no spring nor beam scale.

Investigation may indicate that other products—perhaps yours—can be handled by this modern method. An inquiry will start the search in motion for your product. Write today and let's see what Hy-Tra-Lec can do for you.

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COMPANY SALES OFFICES: JERSEY CITY · BOSTON · DURHAM
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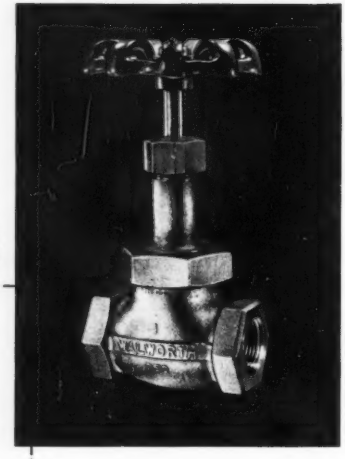
KING & ANDERSON, SAN FRANCISCO
SPERRY GYROSCOPE COMPANY, LTD., LONDON

IDENTIFICATION DISC: An aluminum marking plate on all Walworth No. 225P's facilitates inventory control and makes reordering quick and positive.



take a good look at the Walworth "500 Brinell" no. 225P Globe

NEWLY DESIGNED HANDWHEEL: Patented air-cooled, finger-fit handwheel affords sure grip even with greasy gloves.

– the Toughest Bronze Valve Your Money Can Buy

The stainless steel, corrosion resistant seats and discs are heat treated to a hardness of 500 Brinell – hard enough to scratch glass and crush nails! The valve can be closed on sand, slag, and pipe scale without injury to the seating surfaces. "Wire drawing" is practically eliminated. All parts are accurately machined and gaged. Years of tight, positive shut-off are assured.

Available in both globe and angle types (angle type: No. 227P) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas, or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular.

IMPROVED PACKING: Molded packing of lubricated asbestos reinforced with copper wire. Suitable for practically every service. Valves can be repacked under pressure when fully opened.

note these 7 Great Features

HEXAGONAL UNION BONNET CONNECTION, DEEP STUFFING BOX AND RUGGED STUFFING NUT: Union bonnet connection eliminates any chance of distortion or leakage even though valve is repeatedly taken apart and reassembled.

OVERSIZE STEM: The high-tensile strength silicon-bronze stem assures long life and protection against wear.

SEATS AND DISCS: Plug type seats and discs of stainless steel, heat-treated to 500 Brinell hardness and machined simultaneously to a mirror-like finish, with accurate tapers assures tight positive shut-off with minimum handwheel effort.

EXTRA STRONG BODY: Made of Composition M (ASTM B61) bronze. Thick walls and rugged hexes provide a high safety factor. Valves undergo hydrostatic shell test of 1,000 psi.

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

The same tang every time . . . with

CITRIC ACID ANHYDROUS

In the manufacture of candy, beverages, jellies or any of the other food products using citric acid . . . you'll receive *uniform* results at all times with Pfizer Citric Acid Anhydrous.

Since Citric Acid Anhydrous contains no water of crystallization, it does not "dry out," even after months of storage. Nor does it absorb water. As a result the acidity remains constant, assuring you of "The Same Tang Every Time" in your products.

In addition, freight costs are lower because you save 8½ pounds in shipping weight for every 100 pounds of Citric Acid U.S.P. you formerly used. Citric Acid Anhydrous also enables you to cut handling and storage costs.

For more information, write for folder F-201. Or for data relating to your specific problems, write our Technical Service Department.

CHAS. PFIZER & CO., INC.
630 Flushing Ave., Brooklyn 6, N. Y.
425 North Michigan Ave., Chicago 11, Ill.
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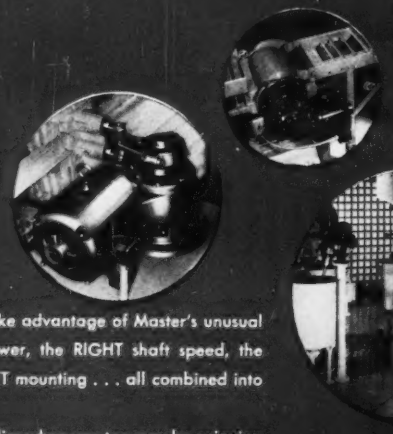
Manufacturing Chemists for Over 100 Years

PFIZER QUALITY ® PFIZER



On big jobs or little ones it pays to take advantage of Master's unusual ability to supply the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

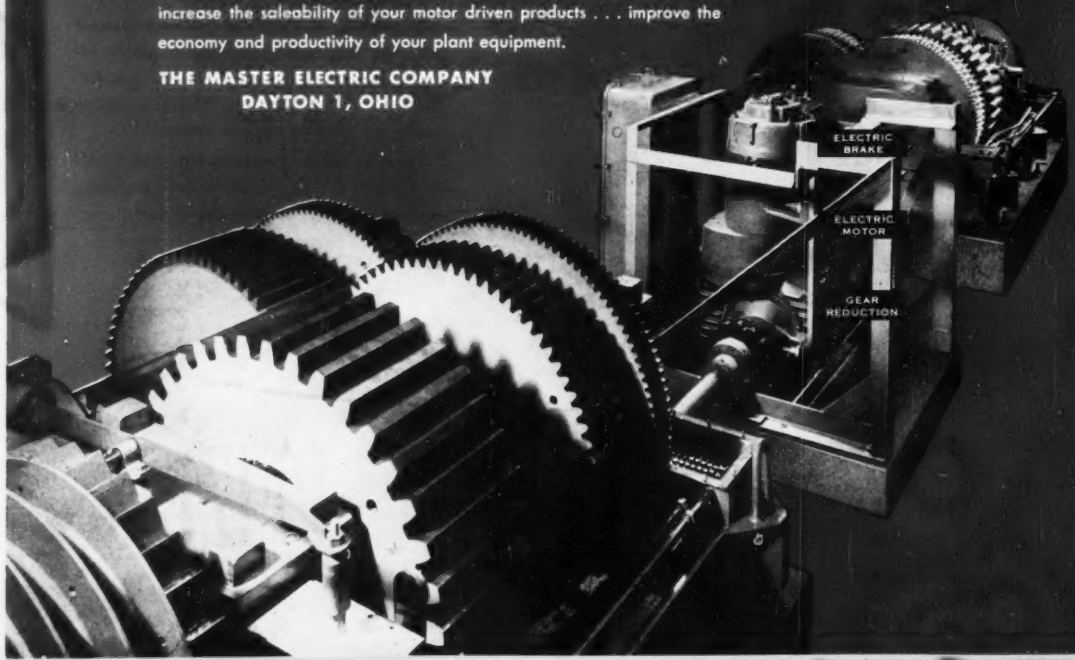
Don't put up with make-shift assemblies when you too may be enjoying these advantages. Master Motors, available in thousands and thousands of types and ratings (up to 150 HP) give you a selection you can get nowhere else.

Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

little ones or **BIG** ones

Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO



HE'S NEVER EATEN BETTER

Whether it's between the slices of a sandwich or in the form of a juicy T-bone, the meat that today's citizen eats is the finest that has ever been available—thanks to over a half century of advances in packing techniques and practices.

It was 54 years ago when Worthington made one of the first refrigerating installations in the meat packing industry. Our first customer was one of the leaders —Armour (then E. F. Dudley Co.).

A year later, in 1898, a large Worthington System was installed for the Boston Packing and Provision Company.

But this was just the beginning. Since the turn of the century, Worthington constantly worked to build better and more efficient refrigeration equipment to meet the increasing needs of America's packers.

Today, in an industry that to a large extent built its progress on the advances in refrigeration, the Worthington name serves such giants as Armour, Swift, Wilson, Hormel, Morrell, Union Stock Yards and Transit Co., Miller and Hart.

Worthington will continue to serve the packers—and every other industry —with the most complete line of refrigeration machinery available. We want to be sure users of refrigeration equipment everywhere never forget *there's more worth in Worthington.* Worthington Pump and Machinery Corporation, Air Conditioning and Refrigeration Division, Harrison, N. J.

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WORTHINGTON

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AIR CONDITIONING AND REFRIGERATION

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we're specialists in specialty paper bags

Specialists in putting more *sell* into your package. You name the product and we take it from there. A&S specialty bags are custom tailored to your product; specially designed to feed smoothly on your packaging equipment; and colorfully printed to attain maximum shelf appeal.

You can get prompt delivery on specialty bags printed in one to five colors, specifically constructed and designed for coffee, dog food, salt, feed, flour, potatoes, sugar, insecticides, plant food, or similar products. It's time now to re-evaluate your various packages with an eye to the future and the use of new, improved paper bags being designed by A&S Packagers. Write to our Packaging Engineer, A&S Packaging Laboratories, Canajoharie, New York, for further information.

ARKELL & SMITHS · THE OLDEST NAME IN PAPER BAGS · A&S

ARKELL and SMITHS

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"WE'VE LEARNED FROM LONG EXPERIENCE . . .

. . . R. S. Hackman,
Traffic Manager, The C. H. Musselman
Company, Biglerville, Pa.

Modernize WITH WHITE"

"**WE NEED** dependable, economical transportation," reports R. S. Hackman, traffic manager of the C. H. Musselman Co., "and we know we get it with our Whites.

"Our drivers and mechanics say no truck can match the new White 3000," he says, "and our performance and cost records bear them out."

It's the same story in all kinds of businesses, large and small. See your White Representative for facts about the advantages of modernizing with Whites.

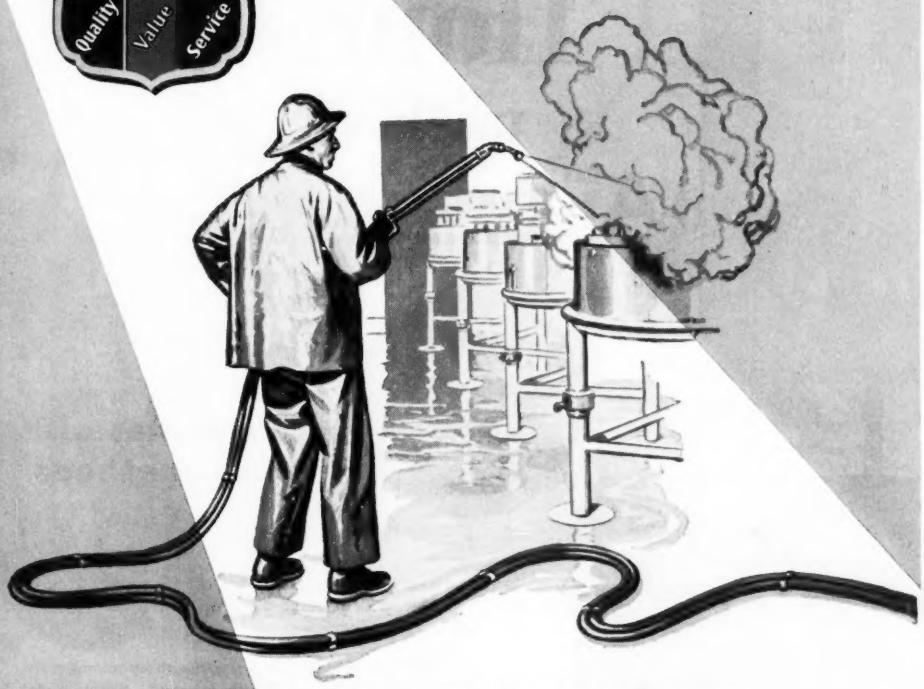
A fleet of 11 White Trucks keep Musselman's sliced apples, tomato juice, apple sauce and other food products in steady supply all over the East.

Tips its cab to service

THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

For more than 50 years the greatest name in trucks

Thermoid
Industrial Rubber Products
Quality Value Service



Hose built for the job! That's the reason for Thermoid's excellent reputation among users of hose.

Our customers know they can rely on Thermoid's recommendations for their requirements . . . whether it's for air, water, steam, creamery, brewers, suction, or the new multi-purpose Versicon hose—all built for the food processing industry.

And men who buy these quality products like the service they get from Thermoid's experienced distributors and sales representatives—and their intimate knowledge of the *buyer's* problems.

Get the hose built for *your* job. Specify Thermoid.

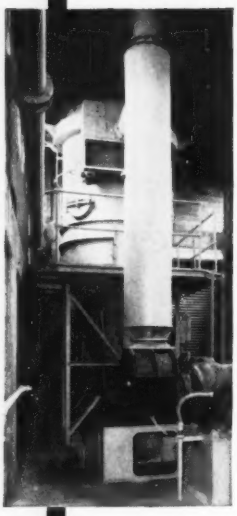
Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

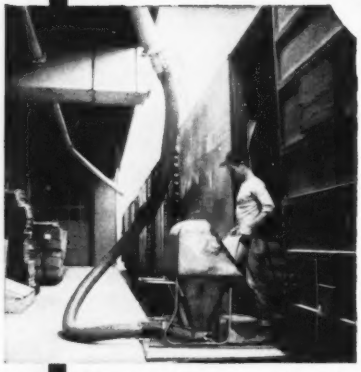
Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

Handling flour with The AIRVEYOR®





Method of unloading contents of bags shipped in box cars, using the same metal hose, attached to portable hopper, as used for unloading bulk cars.

Attaching Airveyor flexible metal hose for unloading from Trans-Flo bulk car.

IT'S ECONOMICAL SAFE SANITARY

outmodes all other methods

Handling flour in bulk makes all other methods completely out of date. With the Airveyor, the operation is fast . . . efficient . . . safe . . . sanitary.

The conveying system is simple, with few moving parts . . . maintenance is reduced, reliability increased. Smooth walled ducts or pipes, no pockets or recesses, where infestation can thrive on accumulated material. At the end of each run the system cleans itself . . . it is self-scouring. One hundred percent retention of all visible dust is guaranteed.

Wherever dry, pulverized materials are handled today, there's a steady and growing preference for pneumatic conveying. Why? Because it reduces fire and explosion hazards to a minimum. It's faster, cuts down manhours as no other method can do, and it's sanitary.

Fuller will be glad to make a survey of your conveying operations and, without any obligation whatsoever, make its recommendation as to the betterment of your materials handling.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS, AND ASSOCIATED EQUIPMENT

FULLER COMPANY, Catasauqua, Pa.

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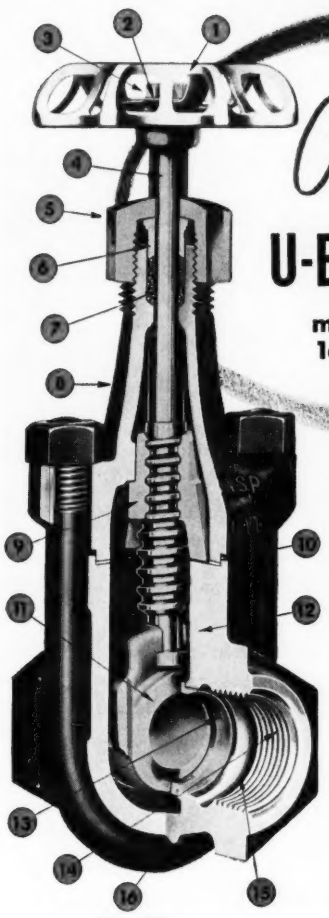


Only Jenkins U-BOLT GATES

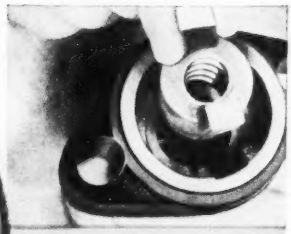
measure up to this 16-point standard

1. Perfect-Grip Handwheel
2. Valve Index Plate
3. Secure Wheel Nut
4. Heavy Manganese Bronze Spindle
5. Large Packing Nut
6. Self-centering Packing Gland
7. Deep Stuffing Box
8. Heavy Duty Bonnet
9. Unique Renewable Bonnet-Saver Bushing
10. Body-Bonnet Safety Joint
11. Extra-Wide Gauge Reversible Bronze Wedge
12. Heavy-Duty Body
13. Bronze Seat Rings, Expanded in
14. Full Length Pipe Threads
15. Liberal Diaphragm Clearance
16. Strong U-Bolt

PRESSURES

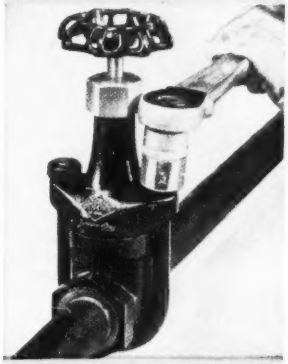
Screwed	Flanged
150 lbs. Steam	125 lbs. Steam
225 lbs. O.W.G.	175 lbs. O.W.G.

Bronze Mounted or All Iron—Sizes ¼" to 3"



BONNET SAVER BUSHING — No need to junk the bonnet when operating threads are worn. Just slip in a new, patented "Bonnet-Saver Bushing" and have good-as-new thread engagement.

EASY TO CLEAN — You can really get into the bonnet of this valve to clean out the chamber above the operating threads.



RUGGED CONSTRUCTION — Here's proof. When the U-bolt nut was tightened down with a 14" socket wrench until the high tensile steel bolt broke, the heavy duty body and bonnet did not crack!

TROUBLE IS RULED OUT! Check these 16 advanced features—for wear-resistance . . . for ease of maintenance. From handwheel to diaphragm, notice how thoroughly trouble has been ruled out in designing this U-bolt valve. No other valve in its class measures up to Jenkins U-bolt Gate on all these points, many of them exclusive.

You can take it apart and put it together again in two minutes, and it's a cinch to clean. When operating threads become worn, just slip in a new "Bonnet Saver Bushing" and restore it to new-valve efficiency. It's a favorite for those plumbing-heating, mine, mill or any services where excessive sediment is tough on valves and where freezing is a hazard.

For "renewability" without waste, bull-necked endurance, and low upkeep cost, you can't beat Jenkins U-bolt Valves. Yet they cost no more! Full details and specifications in new circular, Form 179-B. Jenkins Bros., 100 Park Avenue, New York 17. Jenkins Bros. Ltd., Montreal.

Sold through leading Industrial Distributors

JENKINS VALVES

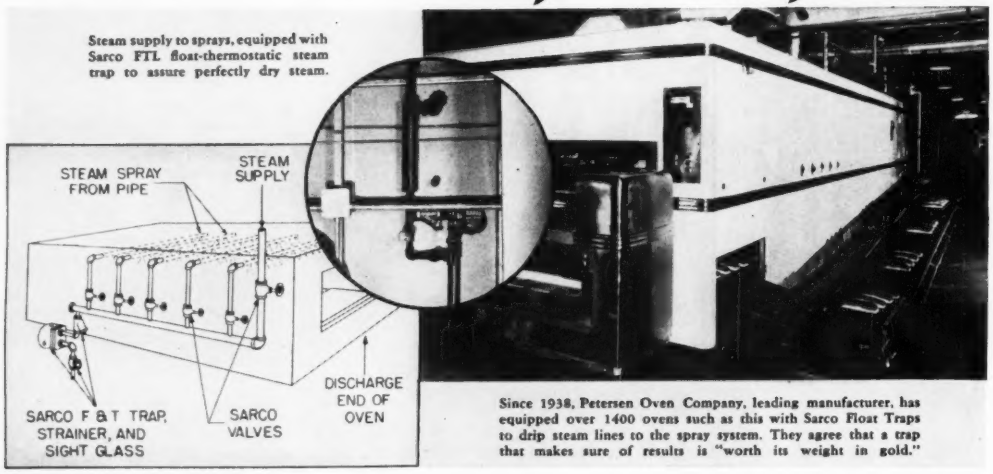
LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros

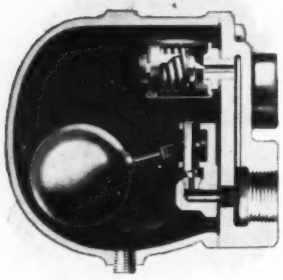
Worth its weight in Gold

Steam supply to sprays, equipped with Sarco FTL float-thermostatic steam trap to assure perfectly dry steam.



Since 1938, Petersen Oven Company, leading manufacturer, has equipped over 1400 ovens such as this with Sarco Float Traps to drip steam lines to the spray system. They agree that a trap that makes sure of results is "worth its weight in gold."

Schematic diagram of typical spray system for bake ovens, showing Sarco FT drip trap.



Sarco Float-Thermostatic Steam Trap

Built-in air vent has standard Sarco helical bellows. Air binding is impossible. All mechanism on cover, reached for inspection or cleaning without disturbing piping connections. Three types, 5 sizes, six pressure ranges.

On steam spray systems, used in the big automatic gas ovens, to give that well browned, glossy finish to rye bread and rolls, absolutely dry steam is essential.

If water were allowed to pass along the steam supply line and reach the nozzles, the fine, hot, uniform mist would turn to rain and the finish would be ruined.

SARCO FLOAT • THERMOSTATIC STEAM TRAPS

are ideal for this service because they discharge condensate continuously, as soon as it forms. These traps do not need to cool or to wait until steam leaks out of buckets, before they fill and discharge.

The built-in air vent positively prevents air binding. Instantly ready—always on the job.

New Bulletin No. 456 describes three distinct types to meet all conditions. Write for it today.

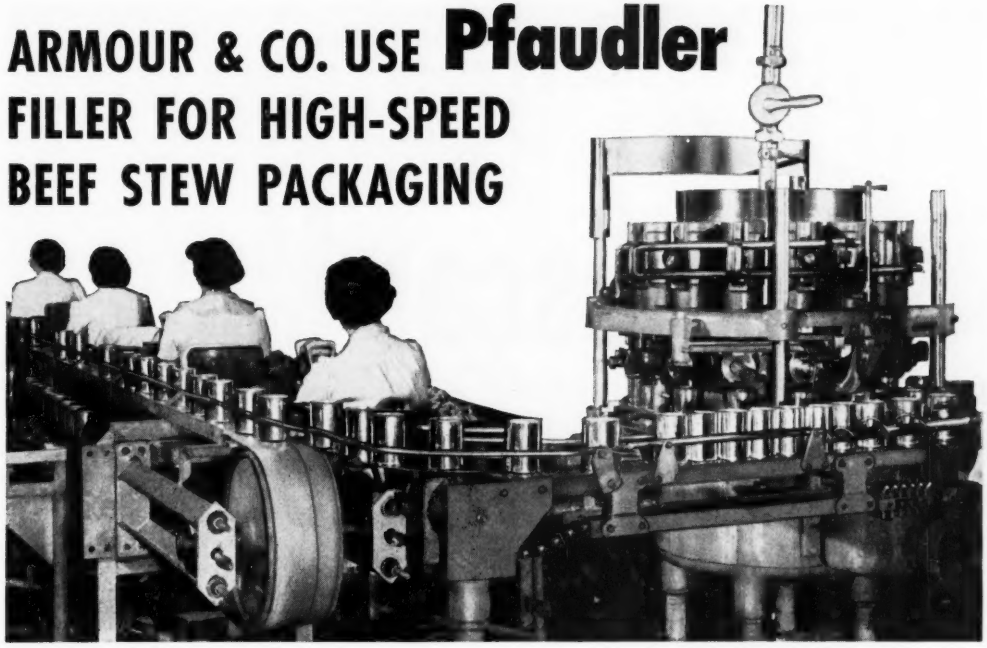
341

SARCO SAVES STEAM

SARCO COMPANY, INC.
Represented in Principal Cities
Empire State Building, New York 1, N. Y.
SARCO CANADA, LTD., TORONTO 8, ONTARIO

IMPROVES PRODUCT QUALITY AND OUTPUT

ARMOUR & CO. USE Pfaudler FILLER FOR HIGH-SPEED BEEF STEW PACKAGING



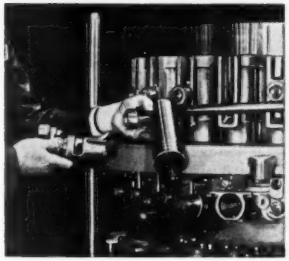
THIS PFAUDLER 14-station Rotary Piston Filler is used for packaging beef stew in No. 2 containers at the Armour plant in St. Paul, Minn.

Armour & Co. have found that their new Pfaudler Rotary Piston Filler delivers the high-speed operation that boosts packaging efficiency. And Pfaudler easy-cleaning features help to keep filling costs down.

Whatever your meat filling job, you too, can speed operations and cut costs with a Pfaudler Piston Filler. One reason is that a single Pfaudler Filler can speed from 100 to 600 containers per minute along the line, depending on the product being filled. You'll need fewer fillers to do the job.

You can change from one product to another in mere minutes because Pfaudler Fillers are so easy to clean. This eliminates many hours of costly labor. Pfaudler Fillers make this saving possible because they are the *only* fillers in which both the pistons and cut-off valves can be readily removed by hand.

Spillage and waste are virtually eliminated by the Pfaudler "no-can-no-fill" feature. Instantaneous volume adjustment controls fill within a fraction of an ounce.



NO TOOLS ARE NEEDED to remove pistons and self-compensating cut-off valves. They're fast and easy to clean, too. This helps improve sanitation and cut labor costs.

For full details contained in our special filler catalog, just mail the handy coupon.

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New G-E equipment saves Oscar Mayer $750 per week!

Better steam extraction, plus proved reliability of old turbine, determines midwest meat packer's choice of new G-E unit

As part of a plant expansion program, Oscar Mayer & Co., meat packers, early in 1950 increased the power-system capacity of its Madison, Wisconsin packing plant by installing a General Electric 3000-kw turbine-generator and metal-clad switchgear assembly. An important factor in their decision was the performance of an existing G-E turbine-generator in the plant. In 10 years of continuous operation, this unit has needed only two minor repairs. That's reliability!

Running 16 hours per day, the new G-E turbine-generator provides more efficient steam utilization, supplying extra process steam and electric power. As a result, it saves about 100 tons of coal per week at $7.50 per ton, or $750 per week. That's savings!

If the economics of *your* food-processing operation justifies co-ordinating generation of power with production of process steam, you too will want the reliability and savings that G-E power-system equipment can give you. Ask your G-E food-industry specialist to discuss your modernization or expansion needs—early in your planning. Meanwhile, write for Bulletin GEA-3277 "Turbine-generators." *General Electric Company, Schenectady 5, New York.*

POWER SYSTEM EQUIPMENT

FOR

food plants

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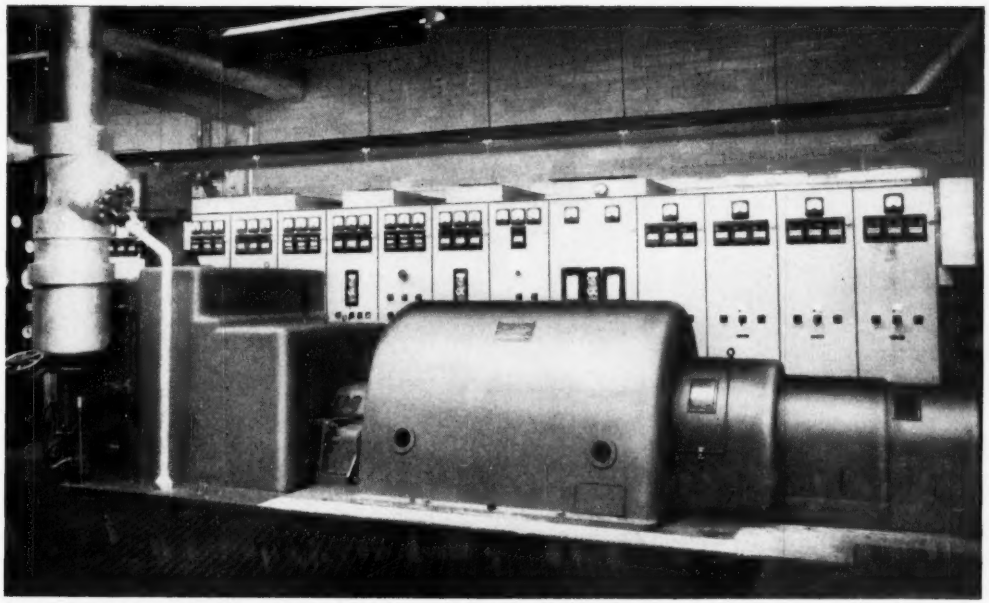
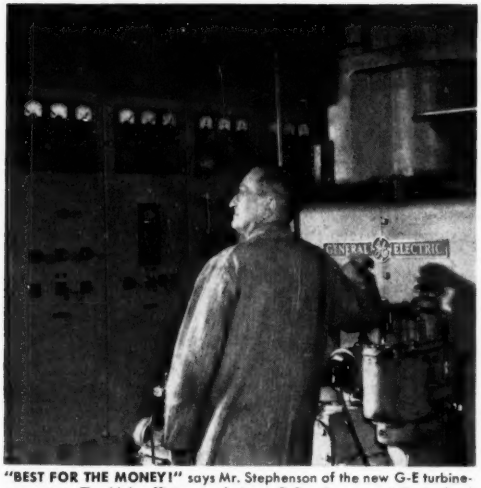
G-E Motor Course helps train your food-plant workers

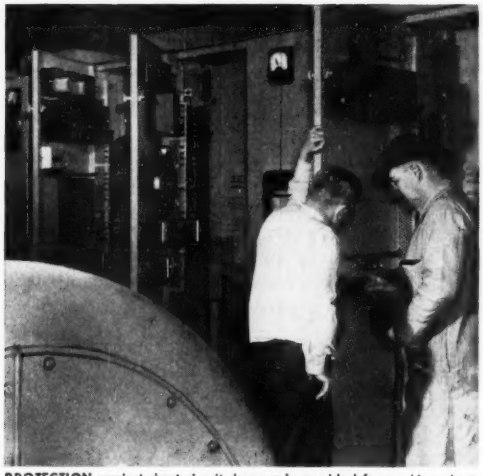
General Electric's new Motor Selection and Application Course is timed to meet today's need for more motor know-how on the part of your employees. A G-E "More Power to America" program, it pictures clearly and simply how motors work, types now in use, and practical pointers on selecting and applying them for specific jobs. Complete kit includes instructor's manual, 9 slidefilms with records, student review booklets, and sturdy carrying case. Ask your G-E representative for a free copy of the manual. For more information on the course, send for Bulletin GEA-4938-16.



BETTER EXTRACTION PERFORMANCE is obtained from this new G-E 3000-kw turbine-generator than from the previous unit, according to Mr. E. B. Stephenson, chief operating engineer of the Oscar Mayer plant in Madison, Wis. The unit, together with the G-E metal-clad switchgear in background, was recently installed as part of a plant expansion program.



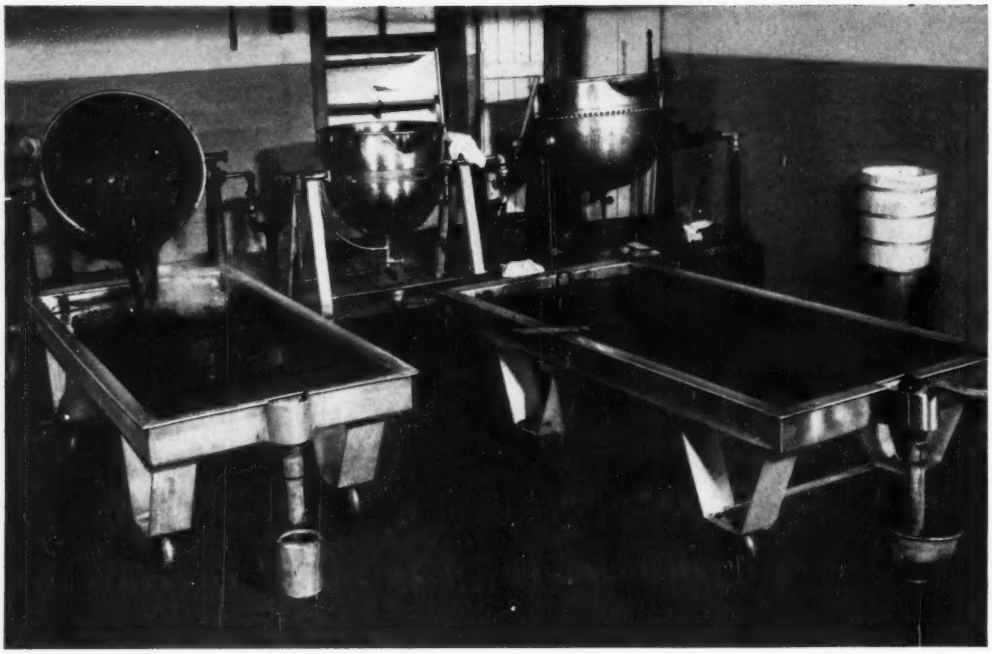
"BEST FOR THE MONEY!" says Mr. Stephenson of the new G-E turbine-generator. The high efficiency of these G-E units—especially in food plants where they help co-ordinate the production of process steam with the generation of electric power—provides maximum output per dollar of fuel cost.



PROTECTION against short circuit damage is provided for packing-plant equipment by the new G-E metal-clad switchgear assembly. Factory wired and assembled, these units are quickly and inexpensively installed, permit expansion within existing buildings by their space-saving compactness.

GENERAL ELECTRIC

652-10



ENDURO HELPS BAKERY
POCKET COOL SAVINGS

Here you see Republic ENDURO Stainless Steel in use in fruit cooling tables. That's just one ENDURO application in this eastern bakery which prompts management to report that: "It affords every advantage claimed for it. It results in savings in the long run. Upkeep has been nil, because this ENDURO equipment has never required any special maintenance."

That's the way it is with Republic ENDURO Stainless Steel. Wherever used, it rapidly becomes the standard by which all equipment is judged. ENDURO offers a remarkably long, profitable life. (This bakery equipment, for example, has been doing its job faithfully for a quarter-century!)

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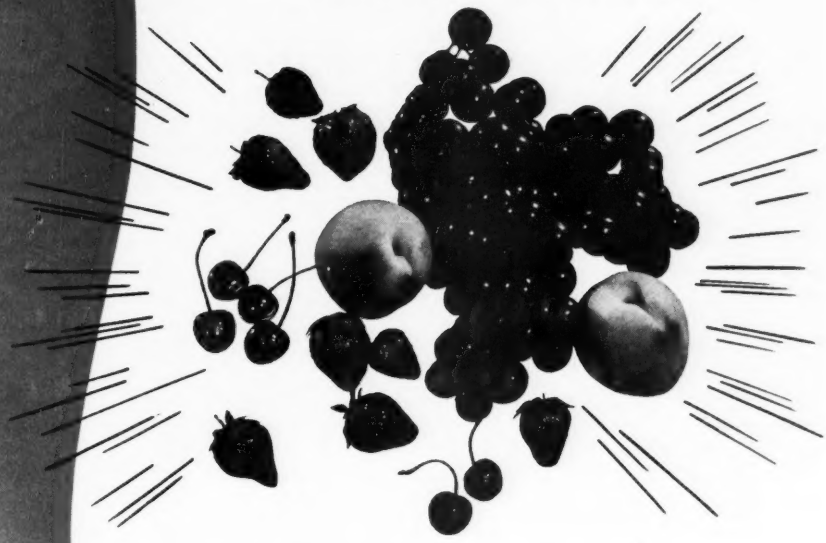
THERE *IS* SOMETHING NEW



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With This NEW Improvement Niagara "No-Frost Method" puts you a big step ahead in trouble-free, automatic refrigeration or freezing

Niagara "No-Frost Method" keeps frost and ice COMPLETELY OUT of your cooling, chilling, freezing or cold storage.

It uses Niagara No Frost Liquid Spray to keep frost and ice from ever forming. It gives you, automatically, refrigeration with no defrosting, and full capacity NEVER cut down by ice building up progressively on refrigeration coils.

Now, a NEW design No Frost Liquid concentrator, using a new principle, takes away moisture as fast as it is condensed by evaporating it at low temperature—not boiling it away at high temperature. It has 14 times the capacity of the old method per dollar of investment—one concentrator will handle a battery of high capacity spray coolers.

This gives you more refrigeration at lower cost; less machinery in less space. You operate at high suction pressure, saving power and wear and tear on compressors.

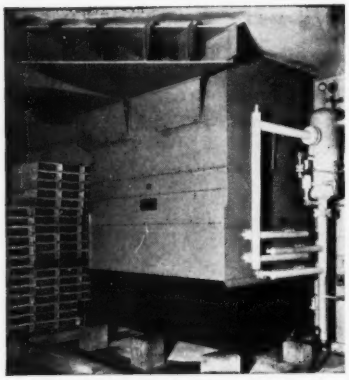
The extra capacity and lower cost both for equipment and operating makes this method advantageous for every type of refrigeration use—both for freezing and for moderate temperatures—for large "live" loads as in meat chilling or in fruit and vegetable pre-cooling—for rooms that are filled and emptied of product daily, such as milk rooms and terminal storage warehouses.

You get true trouble-free refrigeration . . . No brine . . . no salt solution . . . no dirt . . . no mess . . . It is entirely clean; you get rid of dirt and odors. You reduce both equipment and operating costs.

With Niagara "No-Frost Method" you easily keep constant temperature of products in your rooms, improve quality, get more production.

There are two series of concentrators: one, with evaporating capacity up to 6 gal. of water per hour, is economical for small freezing or hardening rooms, milk rooms, single room storage. The other, evaporating up to 36 gal. per hour, serves a battery of large coolers as in multiple floor cold storages, large chilling, freezing or pre-cooling plants.

For complete information write to the Niagara Blower Company, Dept. FI, 405 Lexington Avenue, New York 17, New York.



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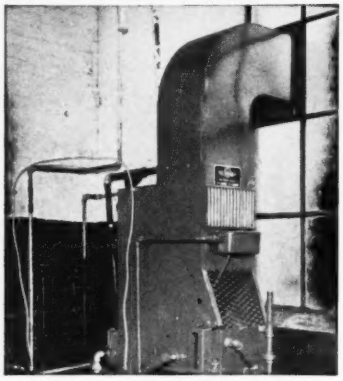
With the "No-Frost Method" you always get the full amount of refrigeration your compressor will deliver and for which you are now paying. If you need extra capacity, the Niagara "No-Frost Method" can help you get it with your present compressor.



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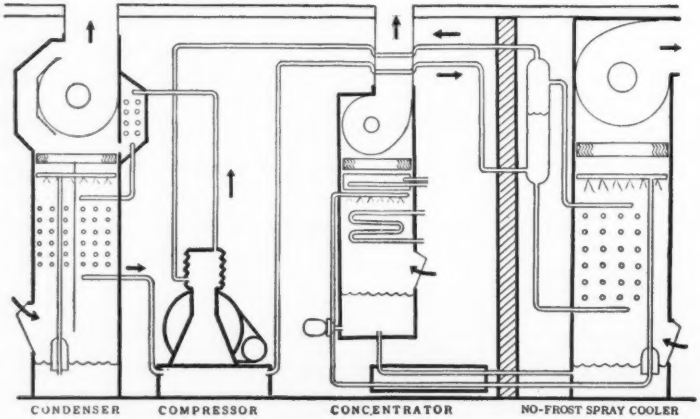
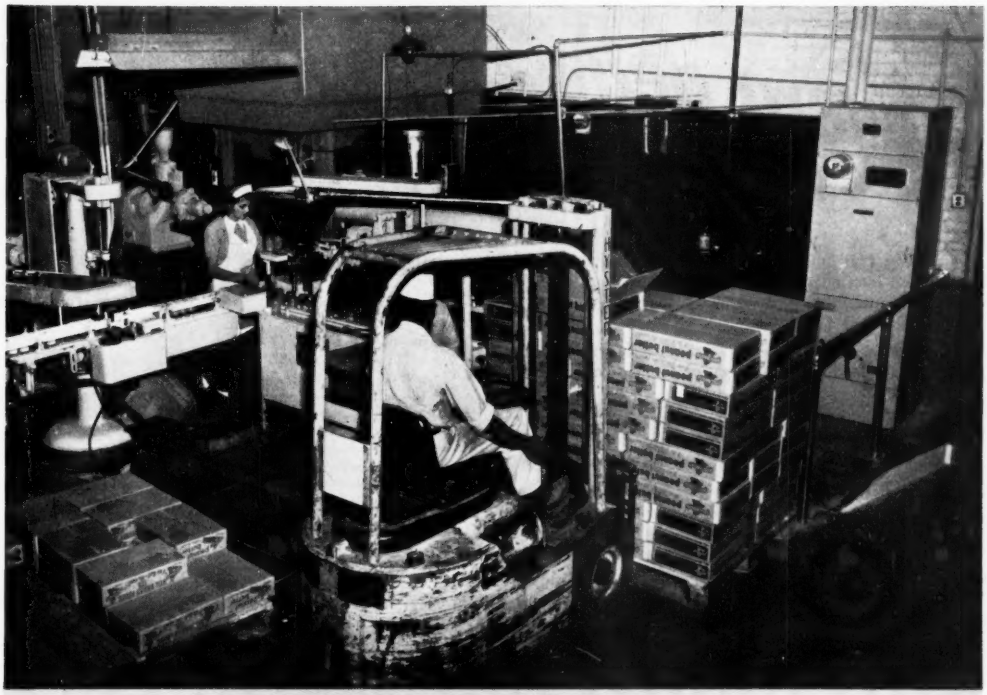
No salt solution . . . No brine . . . The Niagara "No-Frost Method" gives you a clean system, clean rooms, clean equipment.





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HYSTER 20 (2,000 lbs. capacity) comes in 6 model variations. The complete Hyster line has capacity ranges from 1,000 lbs. to 30,000 lbs. Write for literature.

MATERIALS HANDLING SUPERVISORS like the Hyster 20 because it transports fast, stacks high, gets in and out of tight places, rolls on pneumatic tires; is rugged and powerful.

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- Leader in the multi-stop delivery field for 14 straight years.
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- America's largest exclusive truck service organization.

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*Metro. Registered trade mark of The Metropolitan Body Company, Inc., subsidiary of the International Harvester Company.

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1
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POWERS® SINGLE SEAT V-PORT *Characterized* FLOWRITE VALVES Give—

Special Flow Characteristics—High lift V-Port plug provides proportional flow throughout entire lift of stem as shown in chart below.

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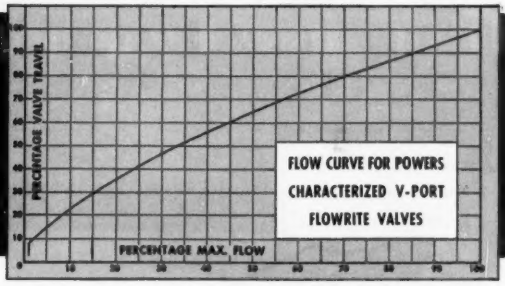

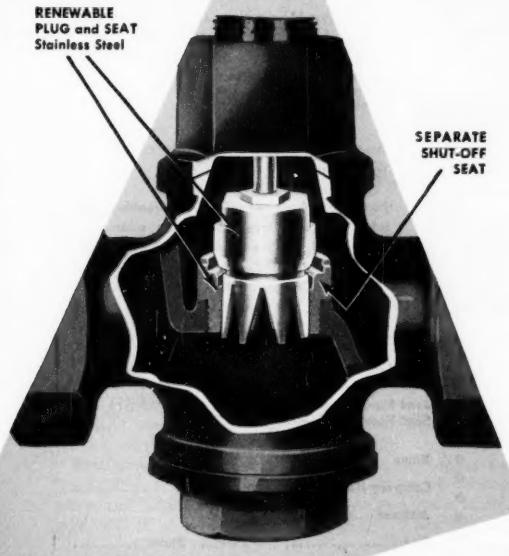

Better Control—Less Maintenance—Superior design of stainless steel plug and seat reduces wire drawing, insures longer life and tight shut off. V-Ports do the throttling, protecting separate shut off seat. Plug and seat are truly removable and can be easily replaced in the field. Inner valves are machined and precision ground and lapped within very close tolerances.

Low Hysteresis—Due to smooth rolling diaphragm and polished stainless steel stem in preformed lubricated packing.

Easy to Adjust—Ball bearing adjusting screw; rust proofed steel calibrated springs with full travel in 5 or 10 psi.

Easy to Install—Powers Flowrite V-Port valves have double unions and bronze body with rugged construction to withstand piping strains.

Easy to Service—Valve and top are easy to take apart and re-assemble, facilitating inspection and maintenance.

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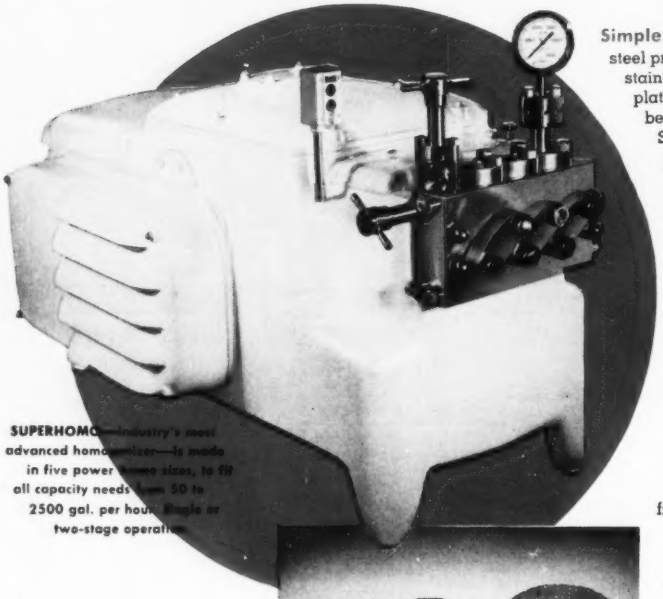

SUPERHOMO—industry's most advanced homogenizer—is made in five power frame sizes, to fit all capacity needs from 50 to 2500 gal. per hour. Single or two-stage operation.

Simple, Sanitary Construction — Stainless steel product contact surfaces. Precision-ground stainless valve plugs and seats. Cadmium-plated springs. Non-absorbent, synthetic rubber gaskets. Conforms to 3A Sanitary Standards.

Longer Service Life—Interchangeable, reversible homogenizing valve parts double valve service life. Lower pressure operation reduces wear on valves, gears and motor.

Shorter Cleanup Time — Low height makes every part of Superhomo easily accessible. Cylinder block designed for quick disassembly — 33% faster cleaning. Long-lasting neoprene plunger-seals easy to remove for sterilizing.

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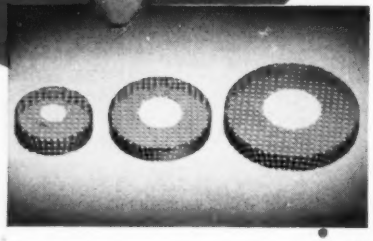

Another Reason Maintenance Is So Simple

Perforated, stainless steel replaceable caps take 98% of homogenizing valve wear . . . keep valves in top condition . . . provide new homogenizing surfaces daily . . . extend area of effective homogenization.

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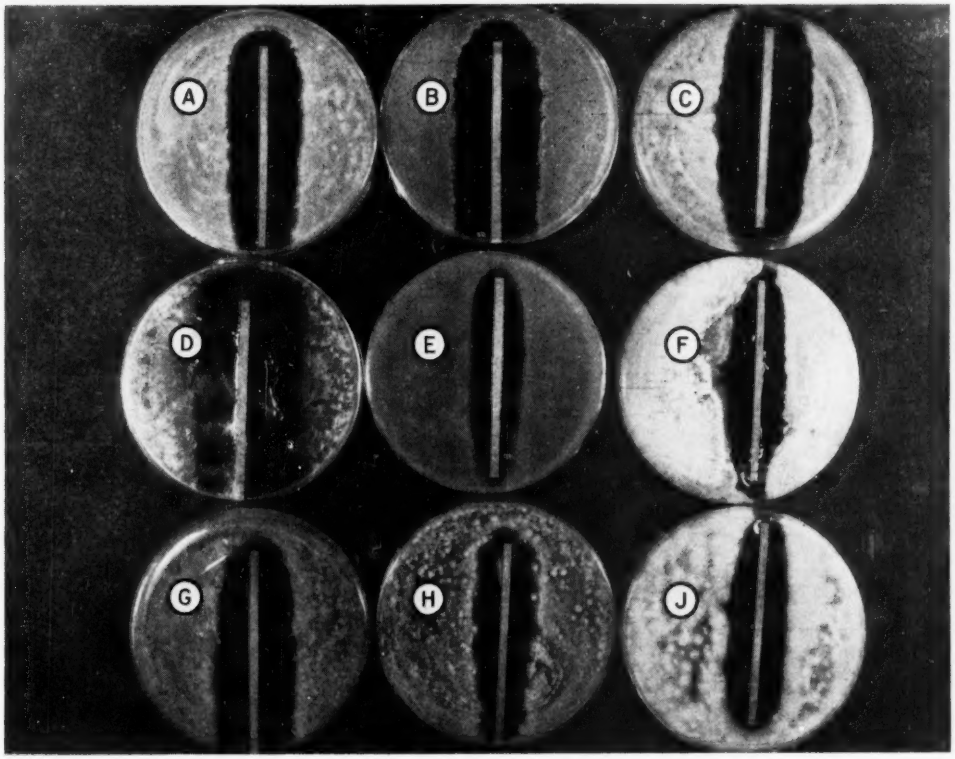


MOLD-INHIBITING ABILITY of copper-8-quinolinolate is graphically indicated here by the dark areas around agent-treated (2 percent solution) strips of kraft paper imbedded in potato dextrose agar plates inoculated with various mold growths. The several species shown—penicillium (A-C), aspergillus (D-F), and fungi imperfecti (G-J)—were isolated in different areas of a meat packing plant. All told, some 75 kinds of growths were used in the tests.

New Coating Agent Promises MOLD-FREE SURFACES

Growths on walls and ceilings are seen averted—thus boosting sanitation and lowering costs—by applying paints formulated with recently developed fungicidal agent. Possibilities in other impregnating materials also cited

L. G. HERMAN and C. L. REED
Respectively, Bacteriologist and Research Paint Engineer, Wilson & Co., Inc., Chicago

Food processors may soon be able to "cash in" on a basically new fungicidal compound[1] added to paints and coatings. For in its solubilized form, non-toxic copper-8-quinolinolate promises to be of outstanding value as a mold and yeast inhibiting agent.

When properly applied in a paint or coating, this compound can save many dollars in plants plagued with wall and ceiling growths.

Fewer cleanups, reduced maintenance, lowered paint requirements, and less product rejections are cited.

Variations of temperature and humi-

dity in food plants tend to condense moisture on walls, ceilings, and pipe lines. The right amount of moisture plus heat activate mold growth whenever sufficient organism food is present.[3]

The solution to such undesirable mold growth is very aptly put by Horsfall,[4] who emphasizes that "prevention of reproduction is the best method of control."

Many plant managers keep the problem under control through the diligent use of water, detergents, and brushing, followed by a chlorine wash or spray. Well-trained maintenance crews can help in mold control with efficient painting procedures; repairing cracks and leaks; replacing damaged sections of floors, walls, and ceilings; and checking all duct, ventilating, and cooling systems for spores or accumulated soil at regular intervals.

List Inhibitor Specs

With labor costs high, management is becoming more interested in fungicidal paint to protect these areas. To be effective, safe, and economical, any compound added to coating material should be—

1. Toxic to all fungi or molds, but not to man or domestic animals.
2. Odorless and tasteless.
3. Colorless at use levels.
4. Stable to heat.
5. Harmless to the material to which it is applied.
6. Competitive in cost.
7. Highly resistant to leaching and weathering.

Numerous compounds have been checked, many of them proving very effective fungicides for other specific purposes. But for mold control they may have decided drawbacks. Organometallic salts are often highly toxic to animal life; sulfur compounds may have undesirable flavors or odors; chlorinated phenols may be too volatile; and some agents are too irritating to the skin, too expensive, or too easily leached to be of value in food plants.[1, 5]

Recently, workers have explored the mold inhibiting possibilities of 8-hydroxy-quinoline and some of its derivatives. Rigler and Greathouse[6] noted that various isomers of this compound exhibited extreme variations in their effect on mold growth. Then rediscovery of copper-8-quinolinolate by Benignus[7] opened a new concept in the field of fungal spore inhibition with organic copper compounds. Mason[8] found that "copper-8-quinolinolate is more effective than Bordeaux Mixture in reducing germination of fungal spores and has many other properties desirable in a good disinfectant."

Now Added to Paints

Solubilized copper-8-quinolinolate,* when properly formulated into paints, can extend the average life of a coated surface—where previous failure of the surface has been primarily due to mold.

In January, 1950, an experimental wooden ceiling in a meat-curing cellar was cleaned and sprayed with a chlorine solution. Half of this ceiling area was coated with a copper-8-quinolinolate in petrolatun and half left untreated as a control. Mold growth was visible within 2 months on the control section—whereas the treated section has, at this writing, remained in excellent condition for 18 months.[9, 10] A laboratory test of the film on the ceiling shows its original fungicidal activity to be unimpaired.

A cheese plant with unusually severe mold growth on the walls and ceiling required a complete cleanup and paint job four times per year. Paint containing 8-quinolinolate solution was applied, and the problem has not recurred up to the present time—18 months.

Conditions in individual food plants, however, vary greatly, hence it is difficult to set any hard and fast rules. Coatings containing solubilized 8-quinolinolate may be formulated to be sprayed, brushed, or flow-coated, depending on the equipment and help available. Coatings will be most effective when the base surfaces are properly cleaned and application is as thorough as local conditions permit.

Must Study Problem

Careful study of the problem is definitely recommended before any direct action is taken. Ordinary oil-based paints should not be applied to wet areas. Nor should wax or petroleum-based coatings be applied in warm, dry areas. If satisfactory protection is to be expected, the surface, as stated, must be thoroughly cleaned. Wooden areas showing signs of rot or deep fungal growth should be trimmed back to solid wood, or the section should be replaced.

Where mold has been present, a penetrating sealer containing 5 to 10 percent 8-quinolinolate will control further growth of the mold mycelium on or directly below the surface of the wood or masonry. In moist areas, complete surface coverage with a fungicide is essential if mold growth is to be suppressed. Where little condensation is expected, oil-based paints containing 5 to 10 percent 8-quinolinolate solution will provide sufficient protection for longer periods of time than similar coatings without the fungicide added.[11]

New lumber used for repairs in damp areas should be soaked in 8-quinolinolate solution containing sealer to prevent rapid mold growth often noted on greenwood. Similarly, plaster, concrete, and brick walls should be treated with the proper sealer when the cure is complete. In this way the

(*Turn to page* 201)

* Available from Scientific Oil Compounding Co., Chicago, under the tradename "Cunilate." An insoluble form, tradenamed "Milmer I," is offered by the Monsanto Chemical Co., St. Louis.

Anti-Mold Spotcheck

So that you may check the "m.q." (mold quotient) of your own plant—and take preventive steps—the authors give the following handy anti-mold briefs on wooden, masonry, tiled, and glass-bricked surfaces:

Wooden coverings **are often the most difficult to control. Abrasions, cracks, and leaks permit soil to accumulate and tends to protect and nourish the mold growth developing here. Yet if well fitted and properly painted, wood can be quite satisfactory.**

Masonry coverings, **such as plaster, concrete, or brick, are quite acceptable when properly sealed and painted. But when allowed to deteriorate, soil is difficult to remove from them, moisture is readily absorbed, and mold growth hard to control.**

Glazed tile **may be expensive to install, but the savings resulting from easier cleaning and the elimination of painting soon may justify the extra outlay. Soil accumulation on this type of surface depends on the environment. Periodic removal of such dirt is required to prevent possible surface mold growth.**

Glass brick **may be advantageously used for outside walls of modern food plants. In some cases, however, it encourages condensation of moisture during processing and cleanup periods. Where this occurs, mold and yeast growth may develop, especially if the surface is infrequently cleaned.**

Incidentally, a wall surface in a continuously dry area may not harbor as many mold spores as does an apparently clean wall where condensation of moisture occurs daily.

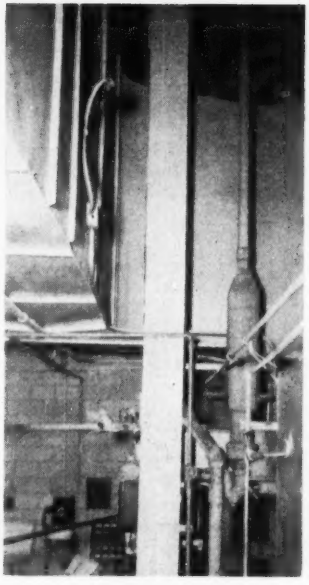
In short, molds can cause trouble in *any* area where soil is undisturbed and moisture and heat conditions unchanged for periods of time long enough to allow spore germination and growth.

It records temperatures

MULTIPOINT unit scores vital temperatures from four dryers in plant.

. . . of product

SANITARY thermocouple gages temperature of product being fed to dryer.



. . . and heated air

MOUNTED into duct, 'couple (upper left) picks up temperature of air.

Drying *Centrally* Controlled

Installation of multipoint recording instrument in dairy's production control office has minimized errors, upped efficiency of spray dryer operations

A. ANDERSON

Plant Superintendent, Rochester Dairy Co-op., Rochester, Minn.

Mounted on the wall in our production control office is a single recording chart that acts as a master check on all spray drying activities in the plant. And, through a thorough study of its records we have practically eliminated processing errors and upped drying efficiency.

Savings accrued have paid the cost of the installation many times over.

Our spray drying floor—considered to be highly productive—houses four Rogers dryers, all with capacities of better than 1,000 lb. per hr. Through these are run numerous products, each involving different heat balances and drying conditions. And since many of our products are batch-tailored to a customer's specifications, changes in the run are quite frequent.

Keeping such a vital, high-volume plant operation "on the beam" required an abnormal amount of supervision and unrelenting effort by shift operators. Even so, there were faced slight errors in product or air temperature, which could mount up. For even the best operator cannot be two places at once.

"Borrowed a Technic"

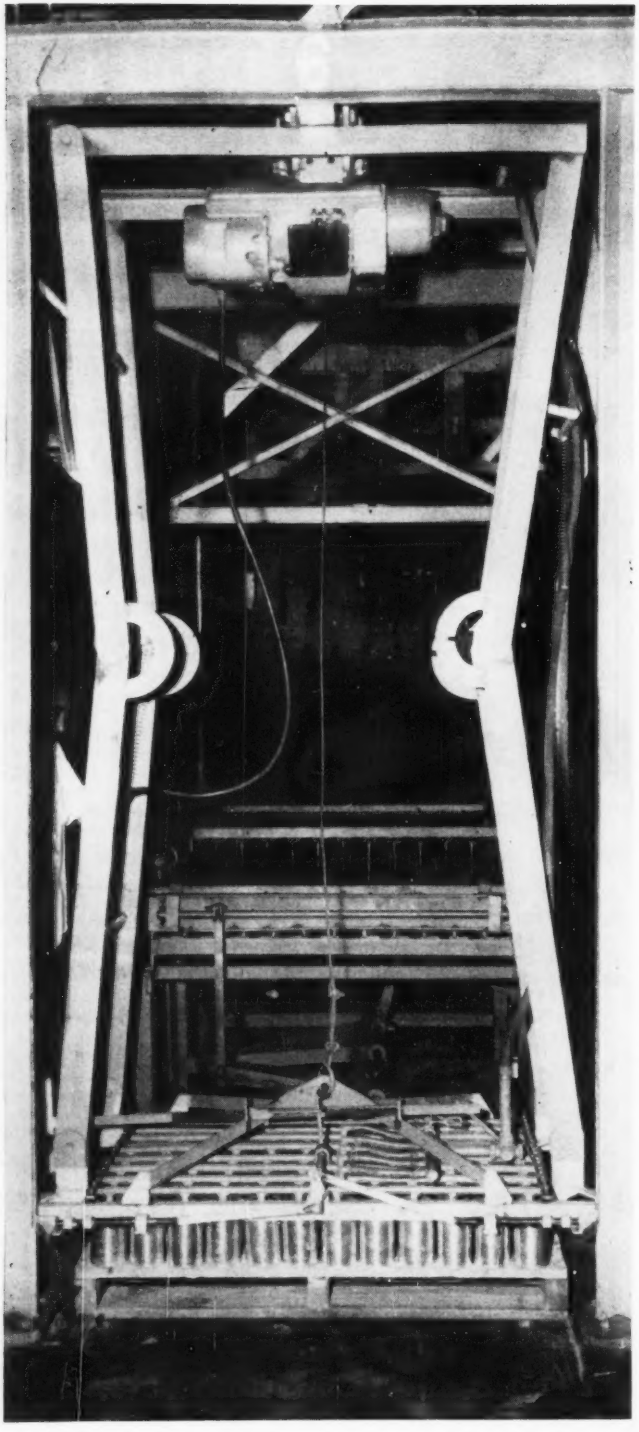
To cope with this situation, we borrowed a technic from our boiler room. In short, we purchased a multiple-recording potentiometer to bring vital temperature readings from all over the drying floor to one central point.

With leadwire running in conduit to the recorder, thermocouples were located in each dryer at the following points: (1) Air source to dryer; (2) hot air to dryer; (3) outgoing air from dryer; and (4) incoming product. Since the recorder is a 16-point unit, all records from the four dryers are thus on one chart.

Thermocouples in the air ducts are all bare-wire units simply mounted through a flange. The product 'couple, however, is enclosed in a specially designed sanitary well, which is clamped into a tee from the product high-pressure pump discharge pipe. This unit is thus available for easy cleaning.

Having all drying temperature readings in special relationship on one chart allows a quick estimate of the heat balance being maintained and provides a check on operating conditions for the product being run. Experience has shown that each product provides a very definite chart pattern—so it is the duty of the operator on shift to guide his process in conformance with this pre-set schedule.

In so doing, the floor operator refers to his two-pen thermometer recorders which are located directly at the dryer. The accuracy of the latter units is constantly checked with readings from the distant potentiometer chart.



High-Speed

Saves On Space And Trims Costs

Special handling units take but a minute to "cup on" several hundred, or take off a thousand . . . Push-buttons and levers actuate new labor-saving system

FE STAFF

Appreciable savings in labor and improvements is the efficiency of its filled bright-can warehousing operations have resulted from use of a new high-speed system of palletizing and de-palletizing in the plants of Hawaiian Canneries, Inc., at Kauai, Hawaii.

Company designed and proved out over several years, the system chalks up the following striking can-handling scores:

- **Palletizes as many as 300 cans per min.**
- **De-palletizes up to 1,000 cans per min.**

Comprising the system are two basic units—one for palletizing filled cans after cooling; the other for de-palletizing the bright cans when they are brought out of the warehouse for labeling and casing. Both units are readily integrated with processing and packaging lines.

The palletizer is also composed of two units:

1. A load-forming device consisting of a series of chains in a compact frame supported by four legs. This unit arranges the cans in a definite pattern determined by the size of the cans and of the pallet.

2. A suction head attached to a standard ¾ hp. electric hoist suspended from a trolley. Supporting this

IN ACTION, suction head gently deposits full tier of cans on pallet. Other tiers are then loaded in this fashion until desired height is reached.

Bright-Can Palletizing

unit is a superstructure formed of I-beams and four legs.

Filled cans may come from the cooler in either a single or multiple line, standing or rolling. If in the latter position, they must be run through a twister turning them 90 deg. Cans then enter the forming device and assume the desired pattern.

Vacuum Does the Job

The suction head of the palletizer is moved over the layer of cans, picks it up, swings it laterally, and deposits it on a pallet. Tier after tier is loaded onto the pallet in this fashion, until the desired number, prescribed by the can size, is reached. A fork truck then moves the filled pallet to the warehouse and positions an empty one in the palletizer.

In the suction head are a multitude of vacuum cups arranged in a definite scheme to match the pattern into which the cans have been formed. These cups are all connected, by means of headers, to a single manifold, and the manifold is connected to a dry vacuum pump by a rubber hose. From 18 to 20 in. of vacuum is maintained.

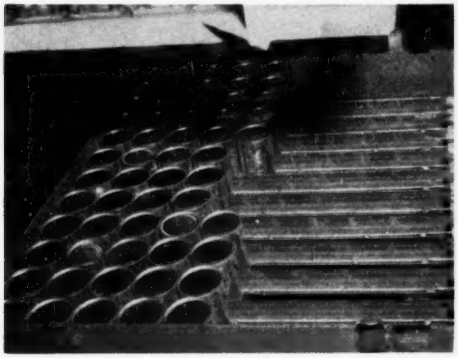
Control of the vacuum is through a valve operated by an easily accessible lever mounted on the suction head. Each unit requires a single vacuum pump of 28 to 32 cu. ft. capacity. Pump is powered by a 1½ hp. motor.

Also contained in the suction head is a double-door type of fastener that locks to two vertical angle-iron supports that define the position of the pallet on the floor, and the alignment of pallet and suction head. Operation of the fastener is via the above mentioned vacuum-valve actuating lever.

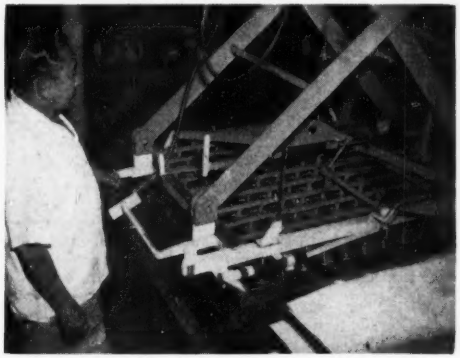
Technic of Operation

With the suction head positioned above the load of cans in the forming device, the operator depresses the hoist-lowering button (see accompanying drawing) until the vacuum cups in the head rest on the cans. He then pushes the vacuum-control lever forward and thus anchors the head to the cans by means of the suction cups. At the same time, he steps on a foot pedal to disengage the drive to the load-forming device and thus remove the pressure exerted by cans feeding into the unit.

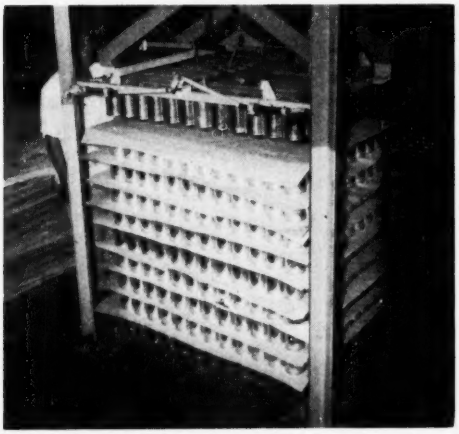
Next, the operator moves loaded



1 **CANS** are collected from process line and arranged in load pattern determined by size of cans and pallet.

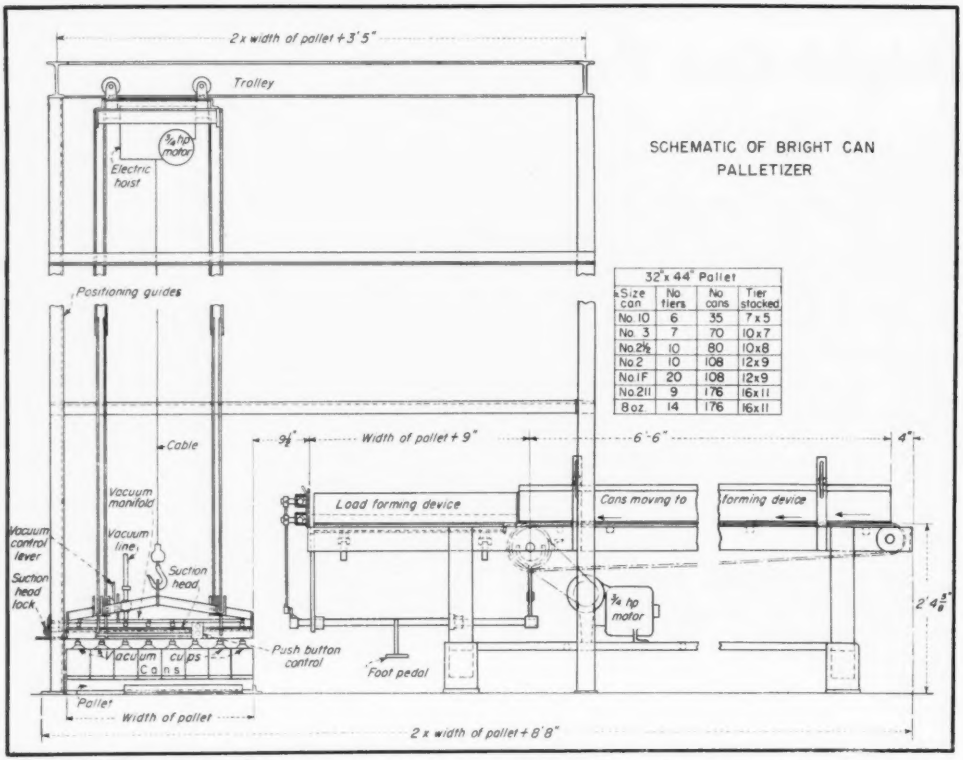


2 **SUCTION HEAD** seals itself to cans. Then entire load will be raised and moved to pallet location.



3 **LOAD** is gently lowered onto pallet, then suction is released and head swung back for another load.

4 **LIFT TRUCK** takes loaded pallet to warehouse, then spots empty one between angle iron guides.



32" x 44" Pallet			
Size can	No. tiers	No. cans	Tier stacked
No. 10	6	35	7 x 5
No. 3	7	70	10 x 7
No. 2½	10	80	10 x 8
No. 2	10	108	12 x 9
No. 1F	20	108	12 x 9
No. 211	9	176	16 x 11
8 oz.	14	176	16 x 11

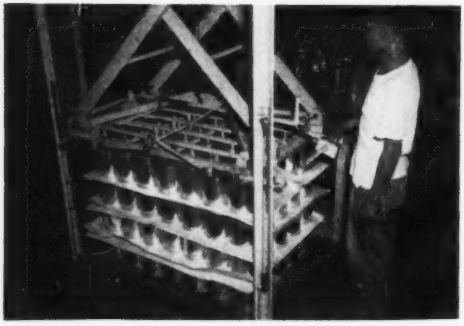
LOAD-FORMING DEVICE assembles cooled cans from processing into a definite pattern to fit pallet size (see table above). The suction head is raised and lowered over forming device and pallet by trolley mounted electric hoist actuated by pushbutton control. In the de-palletizer, a converger unit replaces the load-forming device.

suction head forward to break any headlocks that may exist between the cans attached to it and the ones remaining on the forming device. He then presses the hoist-raising button, lifts the load of cans, and manually moves the entire assembly on its trolley until the two locks on the door-catch position the cans over the pallet.

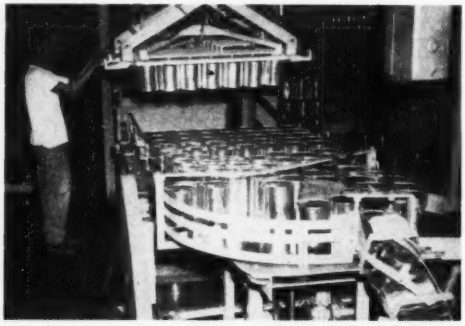
The operator then pushes the hoist-lowering button to set the load of cans on the pallet. Vacuum-valve and lock-controlling lever is pulled out, releasing the cans and unfastening the positioning locks. Then the suction head is raised and returned to the starting position over the forming device.

(*Turn to page* 150)

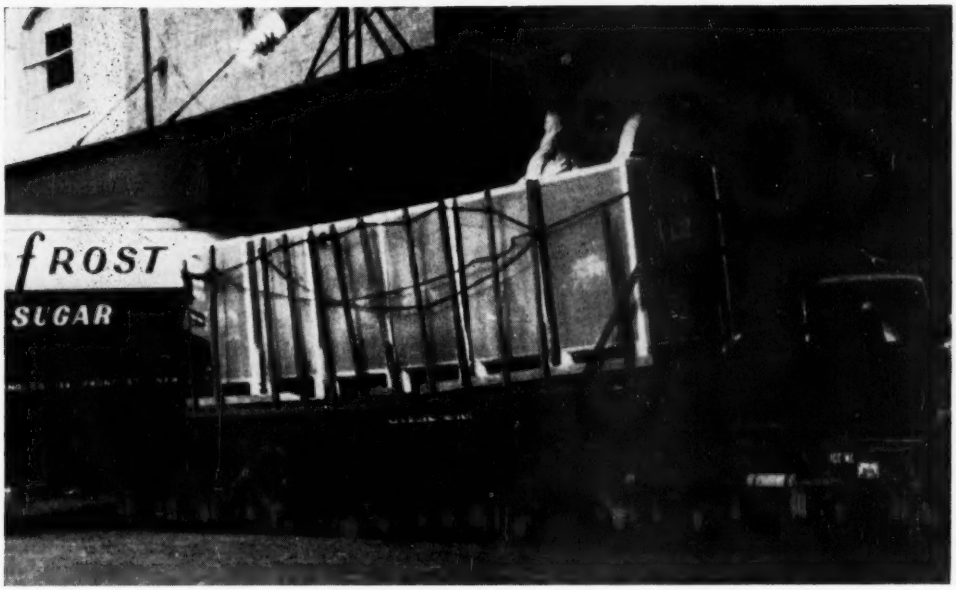
How De-Palletizer Works



OPERATOR lowers suction head over loaded pallet and picks up a full tier of cans. Leakers leave telltale stains on the kraft paper insert below.



HE then swings load and gently deposits it on converger that delivers a single line of cans to labeler. During transfer, operator removes leakers.



SEALED sanitary bins of aluminum offer numerous bulk-material handling advantages. Here, sugar is loaded at refinery.

ALUMINUM

Where It's Used and *Why* In Modern Food Handling

Survey credits metals rise to cost-cutting lightness, durability making for long life, corrosion-resistance that reduces maintenance, simple sanitation, and easing of workers' loads . . . Improvements in methods and equipment stimulated by climb in product-moving charges

FLOYD A. LEWIS
Editor, The Aluminum Association, New York City

Food processors are today making increasing use of aluminum equipment in materials handling, according to a recent, broad industrial survey.

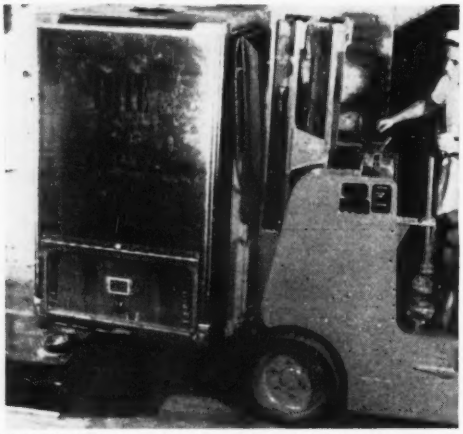
The metal's light weight, long life, low maintenance requirements, and protective-sanitation features are cited as leading factors spurring the post-war rise in applications.

Sought in the study was a fact-and-figure appraisal of aluminum's contributions to the mid-century advances in the handling of materials. And the resulting information, compiled by The Aluminum Association from the data of some 50 manufacturers and from the reports of numerous users in diversified industries, showed that in many plants product-moving operations now represent one-third of total manufacturing cost—in some cases more.

■ **This sober fact is seen as responsible for the extensive step-up in the development of improved, cost-cutting, materials-handling methods and equipment.**

By cutting down on the dead-weight of equipment, aluminum effects substantial savings in manpower. The survey also showed that workers like aluminum equipment because it is easy to handle and readily can be kept clean.

BAKERS: Aluminum brings ingredients . . . and carries out finished products



COMBINATION of aluminum bin and lift truck simplifies handling of incoming bakery items, such as sugar, flour.

MOVING out finished baked goods is reduced to one-man job with use of light aluminum cabinets.

Returns from both the food industry and equipment manufacturers tend to indicate that aluminum materials-handling equipment is more widely used in this top-ranking industry than in any other. Among the chief reasons for widespread uses of aluminum are:

- **It can be steam cleaned without damage**
- **It does not splinter**
- **It is non-absorptive, and**
- **It offers little opportunity for harboring insects or bacteria**

Other advantages the food industry gains through use of this metal in materials-handling equipment are also notable:

- **It is nontoxic—products and materials may be safely handled in direct contact with aluminum containers or conveyors. Its high thermal conductivity brings economies where containers or conveyances must be moved into either heated or refrigerated areas. Further, its nonsparking property makes it valuable in flour mills and similar plants where hazardous atmospheres may exist.**

In selecting equipment, over-all cost should be carefully considered as well as first cost. Aluminum equipment sometimes calls for more of an initial outlay than other types, but its over-all cost is often much lower because of its savings in manpower and maintenance expense and its longer service life. Another point is the salvage value of aluminum equipment.

Broad Uses Cited

Baskets, lugs, tote boxes, and other standard types of containers made of aluminum, are available for handling meats and many other food products in bulk. Major aluminum parts are used in conveyors of all types—belt, roller, skate wheel, and pneumatic. Available are both hand and lift trucks largely fabricated of the lightweight metal. Such equipment as chain hoists which are carried about the plant also employ aluminum for major parts.

Among specially designed aluminum items, milk and beverage bottle cases stand high on the list. And special aluminum trucks have been developed for handling beverage cases and metal drums. Moreover, aluminum trays, racks, pallets, and cabinets are streamlining bakery operations.

How this equipment is being used and the economies and other advantages it has brought the food industry were clearly indicated by the survey.

Aluminum containers of all types, shapes, and sizes are now being made. Many of these follow the same general pattern as older containers made of other materials. Others are designed for handling specific types of materials or to meet special needs of individual plants.

Many Types of Boxes

Aluminum carriers such as the "featherweight" style basket answer many purposes. They are made in 1, 1½, and 2 bu. sizes, weighing respectively 3½, 4, and 5 lb., reports the manufacturer, Franklin Equipment Co., Monticello, Ia.

Boxes and lugs of various sizes for carrying materials from one point to another in the plant are made by a number of firms. The survey showed that these are most widely used in the food industry. Aluminum boxes of 13 different sizes, as an example, are made for food products by Republic Stamping Co., Canton, Ohio. Lug boxes are used for hauling grapes to wineries.

A stack of 50 empty boxes, reports Western Metalcraft, Inc., Olympia, Wash., takes the floor space of one ordinary box and is only as high as six ordinary boxes when stacked. When full and stacked crosswise, these boxes fit neatly into the hand-grip edges, giving a stable stack without injuring the contents.

One die-cast aluminum box measuring 20 by 12 by 8¾ in. deep and weighing 8 lb. is a self-aligning design for safe, high stacking. It is suitable for both handling purposes and temporary storage, also in hand-trucking and standard trailer loading, says the manufacturer, Doehler-Jarvis Corp., New York City.

Brings Savings to Packers

An average saving of $16.79 a year was reported by users of "Alumi-Lugs", mostly employed by packing companies, meat dealers, institutions, and other food establishments, for delivery and storage of meats, poultry, fish, and other perishables. Although the initial cost of this lug box is several times that of the wooden variety, the manufacturer, J. M. Gordon Co., Inc., Glendale, Calif., cites an estimated ten-year life for the aluminum lug.

With the aluminum box, maintenance cost remains low, and no sanitary paper lining is required. Added to these advantages is the lighter weight.

The McKlintock Manufacturing Co., Los Angeles, makes a similar container, as well as a wide variety of aluminum trays for use in butcher shops.

A system for sanitary bulk handling

of sugar, flour, corn products, salt, alfalfa meal, and powdered milk brings substantial savings by eliminating bagged-commodity operations. Maker here is Tote System, Inc., Beatrice, Neb. The equipment comprises a 74-cu.-ft. sealed aluminum bin set up with devices for convenient loading and unloading.

Reporting use of the system, Imperial Candy Co., Seattle, points to substantial savings thus realized through the ability to purchase sugar at the bulk price, plus further savings in intra-plant handling. Also, L. E. Landon, president of Nalley's, Inc., Tacoma, Wash., makes major note of the system's "saving in delivering sugar to the point of use."

In addition, a bin installation in the Emeryville, Calif., plant of Doughnut Corp. of America is reported to have paid for itself out of savings "after just a few weeks' operation."

Figures obtained through the survey average the labor saving at 10c. per cwt. in most installations. And savings ranging from 8 to 40c. per cwt. are noted through elimination of the bag or container cost. Another advantage of this type of system is that the bins are tightly sealed. Thus, moisture is excluded and contents are not subject to attack from outside sources of infestation or contamination. Further, flavor, aroma, and other desirable qualities are retained.

Extensive Applications in Bakeries

Aluminum trays, racks, pallets, and cabinets are streamlining bakery operations. Cabinets come in a variety of sizes for a variety of products—pies, buns, doughnuts, cakes, and other goods. Used to keep the product in sanitary condition until sold, the cabinets are loaded in the plant and transported by truck to a restaurant, cafeteria, or other retail outlet. When empty, they are taken back to the bakery, steam cleaned, and used again.

Cabinets thus made lighter save on labor. For instance, Horn & Hardart, operating major bakeries to service its Automat cafeterias and retail bake shops, required two men to carry an angle-iron pie cabinet holding 18 pies. They replaced this with an aluminum alloy cabinet which is now carried by one man.

Some cabinets have specially designed racks for different products, while others are made to take standard cafeteria trays. One of the larger bread bakers had an experimental aluminum bread carrier developed because he found his carrier weighed as much as the bread it contained. Even aluminum doughnut screens and drain trucks are made by Crescent Metal Products Co., Cleveland, which also supplies the baking industry with a complete line of other aluminum materials-handling equipment.

Mrs. Smith's Pie Co., Pottstown, Pa., uses special aluminum pie boards. Initially cost of these units was more than double that of the old wooden boards. But after a year's trial the bakery began replacing all 40,000 of its boards with aluminum as fast as the wooden ones wore out. Reasons: Greater durability (dead weight reduced 30 percent), elimination of sagging when boards are stacked high, and improved sanitation.

The aluminum boards were designed by Bucks County Enterprises, Quakertown, Pa., which also makes other aluminum equipment for bakers.

Further on the weight score, Boston Metal Products Co., Boston, reports that its portable cabinets can be handled easily by one girl. And Aluminum Bakery Products Co., Columbus, Ohio, offers a carrier for twelve 10-in. pies weighing but 8-lb. Most manufacturers make stock cabinets as well as the custom built.

Dairy Applications

Cost figures compiled by a number of dairies demonstrate savings with aluminum milk-bottle cases. While these follow the same general design of wooden crates, they are engineered for light weight, durability, and protection of contents.

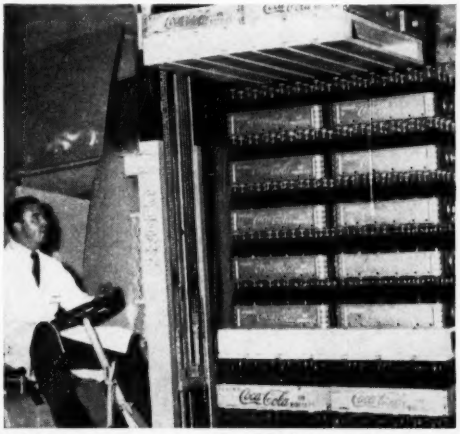
Aluminum made its debut here more than five years ago when the Illinois Creamery Supply Co., Chicago, placed its first model on the market. Again, these cases cost more initially, but their long-run economies are pointed out as bringing down over-all costs.

The aluminum case is much lighter, therefore saves handling and transportation costs. It is stated that a loaded 16-bottle aluminum case can be handled by one man as easily as a loaded 12-bottle wooden crate. The metal case lasts much longer. Furthermore, the maintenance cost is low.

Greatest saving cited with these cases, however, is the reduction in refrigeration costs. Standard practice in dairies is to load the crates with bottled pasteurized milk, then move them directly into the refrigerator. Not only does the metal crate require less refrigeration to reduce its temperature, but it does not absorb water to constitute a further demand on refrigeration.

Dairies in Cincinnati are large users

BOTTLERS



THESE beverage cases, made of high strength aluminum alloy, have long service life, save on shipping weights.

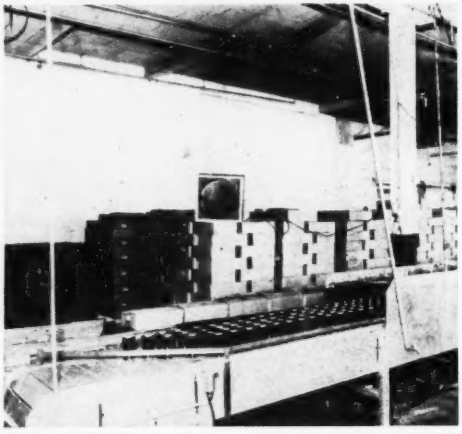
DAIRYMEN

IN COLD STORAGE ROOM, these aluminum milk cases effect an appreciable saving in refrigeration loads.

MEAT PACKERS

QUALITY is protected, when wrapping and packaging bacon, by sanitary features of this all-aluminum conveyor.

CANNERS



GLASS JARS filled with jam and jelly are automatically washed on this corrosive-resistant all-aluminum conveyor.

of aluminum cases. First to convert was the Hyde Park Dairy. President William F. Funk of this company says: "After nearly three years, our delivery routes have hauled 3,000 tons less weight by converting from wood to aluminum. And the old problem of breakage—from one to four bottles of milk with each loading or unloading—is practically eliminated. I would say," Mr. Funk continued, "that we now average less than one bottle broken per month."

Initial dairy in the United States to make a complete changeover to aluminum bottle cases was Hygeia Milk Products Co., Harlington, Tex. In 1946, this company ordered 6,500 cases. And after five years of service, Harvey L. Richards, Sr., chairman of the board, said: "With the exception of cases lost, all are in good condition and should be serviceable for at least three more years—making a total of eight years' life."

In 1947, the Memphis Dairy Exchange, Inc., purchasing agency for member companies, ordered 10,000 aluminum cases. Manager John W. Simonton reports: "Aluminum cases are sound, showing little if any wear. When they do get damaged they require only reshaping, and a repaired case is 'good as new.' Experience convinces us of the weight advantages and the refrigeration savings accruing."

Aluminum bottle cases have also won their place in the bottled-beverage industry, largely for the same reasons as in the dairy industry. Here, again, the aluminum case follows the conventional design, but has special design features to reduce weight, facilitate handling, and protect contents.

An aluminum case first appeared in the bottled beverage industry in 1949, after a three-year cooperative developmental program. Employed was an aluminum-magnesium alloy of high impact strength, called "Alnesium." The case is designed so that its interior "floats" in the frame and acts as a shock absorber for the contents. Weight saving over standard wooden crates is estimated at 250,000 lb. on every 100,000 cases produced and distributed. Originally, only standard 24-bottle cases were manufactured, but today smaller-sized aluminum units also are available.

Cost Per Trip Is Lower

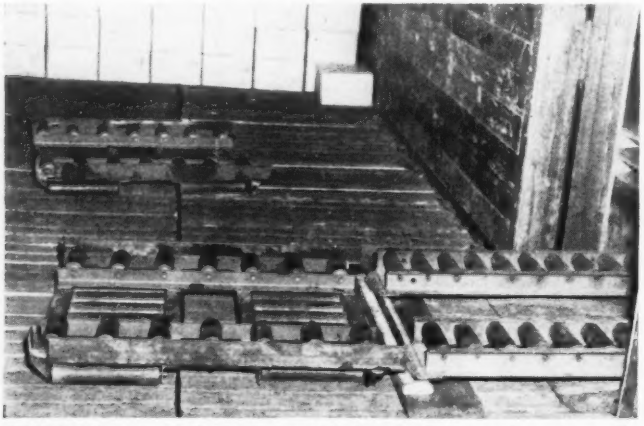
Bottling industry statistics indicate that the longer repair-free life of aluminum cases brings down the per-trip cost of these carriers 40 percent and more. On the score of durability, it is notable that one plant having 25,000 aluminum cases in service for 10 months had only 2 taken out due to accidental damage. One was discarded after being run over by a truck, the other was returned to service after various dents had been bumped out.

A merchandising aspect is brought out by bottlers who report that aluminum cases won them better floor display space in super markets and thus greater turnover of goods.

Since trucks are either containers on wheels or wheeled devices for mov-

(*Turn to page* 177)

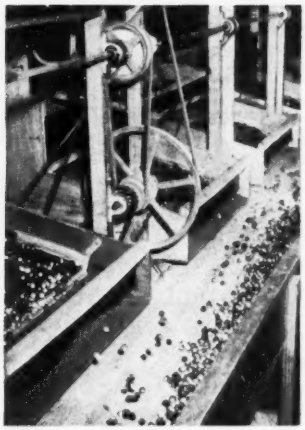
ALL SHIPPERS



LOADING into cars is fast and easy with this aluminum gravity conveyor. In car, two-way sections permit movement direct to stack.

REMOVING extraneous matter is first cranberry-grading step. Here, screen catches vines as berries fall into blower box. Air blast carries away leaves and twigs as berries keep falling to the bottom of the box.

TESTING berries for soundness is next. Flight conveyor lifts clean berries to series of baffle boards. Firm berries hop over the baffles. Those that don't get over after three tries are discarded as unsound.



GRADING sound berries for size follows. From the series of "bouncing boards," cranberries are gravity-fed over these sizing screens. Undersize berries that pass through screens go to the sauce and jelly plant.

Quality Berries—By 4-Point Control

FRESH QUALITY is assured in prepackaged cranberries by a four-point grading system that consists of: (1) Removing extraneous matter, (2) separating firm berries from unsound ones, (3) screening out undersize fruit, and (4) inspecting cranberries for color, shape, and freedom from blemishes.

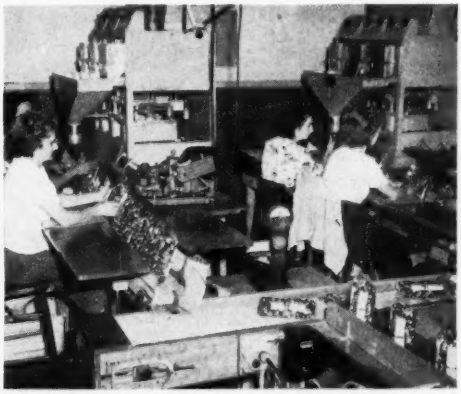
Here, briefly, is how the system works: Berries are dumped onto a blower box that screens out the vines and blows out the leaves and twigs. Next, a flight conveyor elevates the berries to a series of baffle boards. At this stage, firm berries bounce over the baffles and continue to sizing screens. Unsound berries are discarded.

As the sound berries pass over the screens, undersize fruit drop through them and the proper-size berries continue to the inspection station. Undersize berries are delivered to canneries to be processed into cranberry sauce and jelly.

At the inspection station, only the red, unblemished fruit goes by the sorting women. After passing the four grading stations, the cranberries are machine-weighed, then filled into 1-lb. cellophane bags that are heat-sealed.

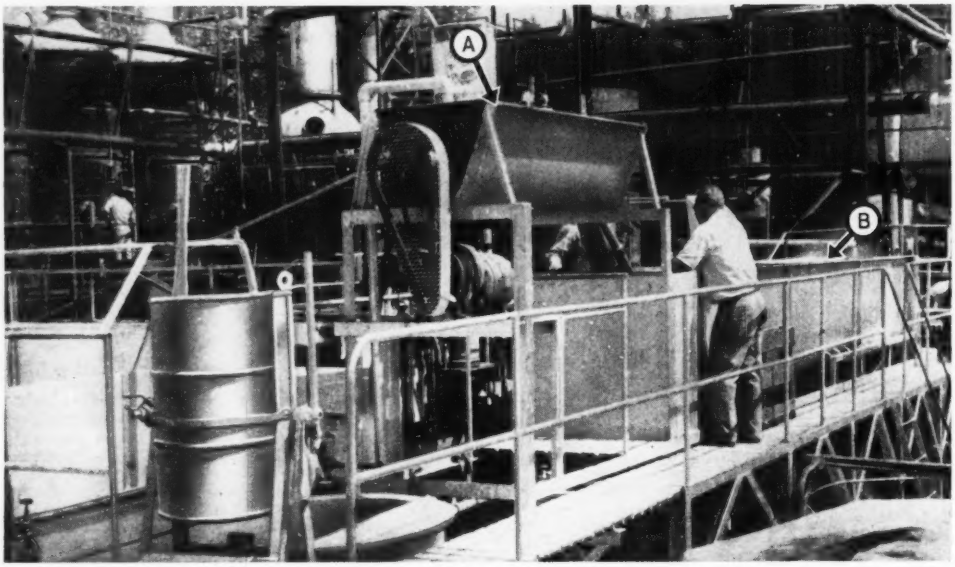
Pictured are Cape Cod operations of members of the Fresh Cranberry Institute, New York City.

INSPECTING the fruit for color and appearance is the final grading step. Cranberries are conveyor-routed to these inspection belts where only red, unblemished ones go by.



PASSING the 4-point grading system, fruit then goes to the packaging stations. Here, gravimetric weighing machines scale 1-lb. lots into transparent, heat-seal bags.

Treater In Action



IN THIS two-part, continuous treater, waste is conditioned prior to pressing. In first section—arrow (A)—pH of material is corrected by addition of lime slurry. In second section—arrow (B)—mechanical agitation and addition of steam completes treatment.

Advanced Fruit-Waste Recovery

Will Roll Dollars *In* — Not *Out*

New plant converts pear-cannery waste to molasses and dried pulp for cattle feed—thus shifting operation from cost to profit column . . . Other applications seen

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Pear waste—once a problem—is now being converted to salable molasses and dried pulp for stock feed at a new waste treatment plant recently put in operation near San Jose in Santa Clara County, Calif.

■ **The system of fruit-waste utilization has demonstrated its ability not only to eliminate disposal costs but to yield a profit. Moreover, the type of dejuicing press developed promises to be useful with wastes other than those from fruits. And in addition, the principle of the machine may also lead to a continuous press for use in the production of edible juices from the fruits and also vegetables.**

Importance of the waste problem in the Santa Clara area is indicated by the fact that about one-third of the pears canned in the United States are packed here. About 50,000 tons of waste were derived from some 120,000 tons of pears during a 60-70 day season in 1950, mostly in the immediate areas of San Jose and Santa Clara in Santa Clara County. The seasonal peak rate is twice the average rate.

To move such loads through the sewage treating systems is unsound because of the short season. The large sewage disposal installations required to handle the peak load would remain largely idle during much of the year. Consequently, land dumping of the waste has been practiced for many years.

Dumping as a method of disposal is, of course, open to improvement, and canners have been working to better their practices. Nevertheless, high costs are involved, and a disposal method that includes utilization has been an important objective for engineering and chemical research.

The problems involved in utilizing

pear-cannery waste have been recognized and studied for more than ten years. Employment of sound trimmings for manufacture of edible syrup for use in canning pears has been studied by Erickson and Ryan,[1] Chong and Cruess,[2] and Neubert *et al.*[3] And this approach is valuable.

But it cannot wholly solve the true waste problem, because here the typical waste is a mixture of cores, peels, and trimmings from sound pears, whole and unsound pears, peaches, grapes, tomato waste, and minor amounts of other waste material.

Considerable work has also been done on the utilization of these gross wastes. Reports on the continuous fermentation of pear waste to alcohol have been issued from Washington State College,[4, 5] and on the anaerobic fermentation of pear waste to produce methane from Oregon State College.[6] Neither of these methods, however, appeared to offer a feasible solution for the San Jose area. A new approach was indicated.

Industry-Government Teamwork

Consequently, in 1949, an industry-government research team undertook the development of a practical process for converting pear-cannery waste to salable products. The Western Regional Research Laboratory supplied chemical engineers and chemists, while the Canners League of California and the Cling Peach Advisory Board provided plant facilities, a plant superintendent, an operating crew, and plant-operating funds to attack the problem on a pilot plant scale.

Technical literature and pre-season laboratory studies showed that lime treatment was a promising method for altering the fresh ground pear waste to facilitate separation of juice from pomace. Addition of lime to raise the pH to about 11 causes alkaline deesterification of the pectin and formation of a calcium pectate gel in the waste.

With ageing, the gel synerizes and clear juice is released. The treated, aged waste can be pressed in a bag or rack-and-frame press to produce a clear juice and a press cake that can be dried without difficulty. Batch pressing is, however, too expensive for use on fruit wastes.

Development of a truly practical technic appeared to depend upon the availability of continuous-type commercial equipment suitable for carrying out the processing steps. The 1949 pilot plant was operated mainly for the purpose of testing commercial units that looked promising. Devices tested included a rotary vacuum filter, a double-cone press, and a vertical screw press. But none of these proved to be satisfactory for the application at hand.

Engineering Closeup

—of the line that changed yesterday's disposal to today's utilization is presented — complete with key-point photos of the equipment — in this month's colorful 4-page FE foldout flowsheet, "Making Pear Waste Salable." Just turn to pages 136-139.

Findings Cited

Yet, considerable knowledge was obtained, during the season, concerning pear cannery waste and its behavior during processing. Here is a brief of the findings:

1. There are wide variations in the chemical and physical properties of pear waste during a typical canning season.

2. Considerable amounts of free juice can be drained from properly treated and aged pear waste, leaving a residue which is more suitable for pressing than the whole, treated waste.

3. Not all pear wastes respond readily to the alkaline deesterification treatment used in the pilot plant.

4. Pear waste, either with or without treatment, is too soft and deficient in actual fiber to be pressed satisfactorily in conventional types of continuous presses.

5. Addition of fiber to pear waste before chemical treatment improves dejuicing of the material in a double-cone type of press, but not to the extent desired.

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Experimental Press . . .

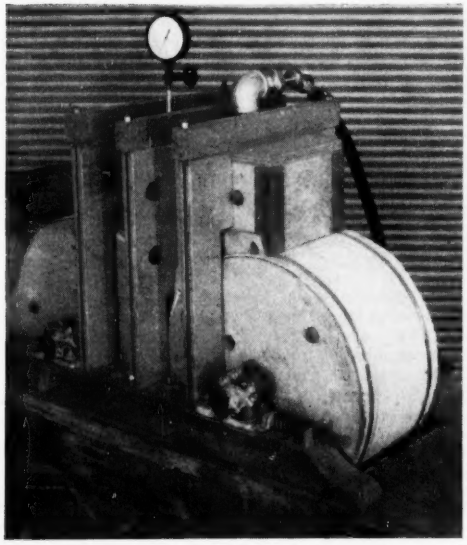


FIG. 1. FIRST model of dejuicing device, made of wood. Drums, faced with filter surface, turn inward from top.

. . . And Plant Unit

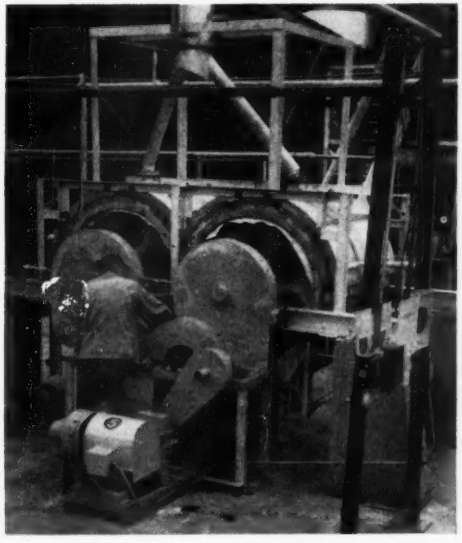
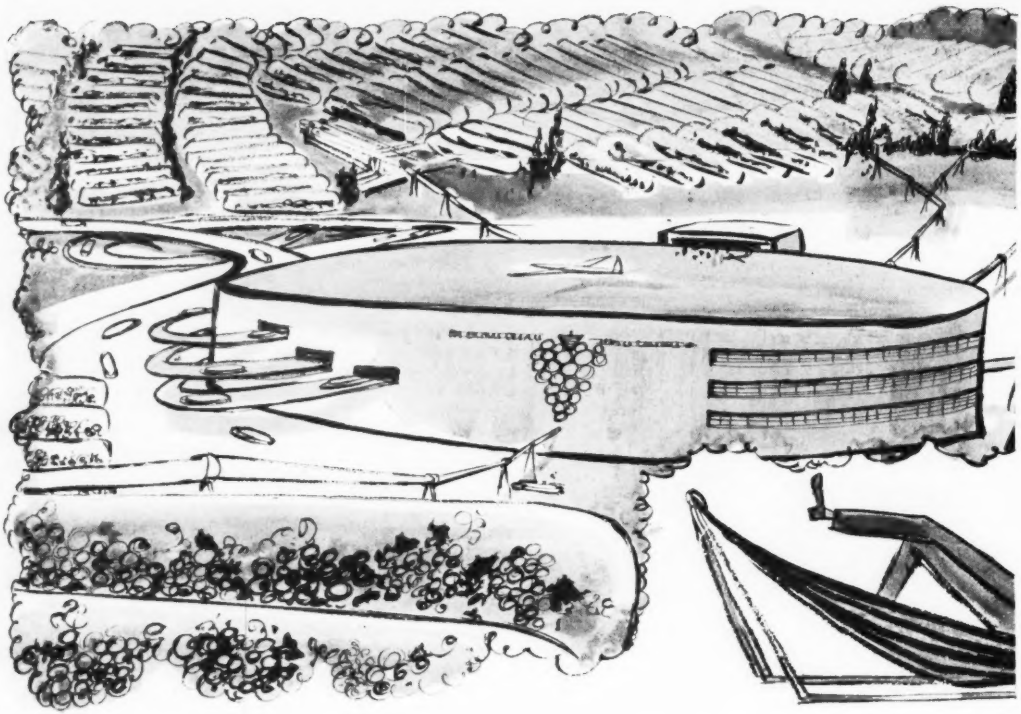


FIG. 2. PRODUCTION drum press. It receives waste at top. Juice runs through filter, solids drop directly below.



A Revealing "Preview" of

Winemaking In 2052 A.D.

Colorful dream of foresighted Chicago vintner offers pointed challenge as it conjures a future wine industry with streamlined, continuous production lines running abreast of latest mid-21st-century technology and engineering

DAVID WIERNIK
Winemaker, Mogen David Wines, Chicago

Wine making is one of the oldest known processes, since wines have been manufactured more than 3,000 years by individuals for their own use or for sale. And wines have been produced in essentially the same way.

Yet, in a fraction of this time, many of the more recent industries have greatly surpassed the wine industry by adopting improved processing technics and highly efficient equipment.

Perhaps some will argue that the wine industry is totally different from others, and that wineries cannot adopt modern assembly-line methods.

But, evidence in the beverage field and in other branches of the food industry does not support such surmising. The latter have adopted advanced practices and set up efficient "straight-through" production lines.

Theoretically, a perfect set-up would involve continual movement in one simple pattern of flow, with an irreducible minimum of batching and waiting, and yet without sacrifice of product quality. We will get to all that in our dream. Just bear with us for a few more paragraphs.

Economically, wine is highly important. Its annual consumption had reached 140,000,000 gal. in 1950. And investments in wineries, inventories, and other related materials, probably total well over a billion dollars.

Today's Methods Briefed

In present practice, grapes are first picked by hand and trucked to the winery. Here, they are crushed and allowed to ferment—with or without the addition of a yeast culture. Yeast

converts grape juice sugar into alcohol and carbon dioxide. In addition, subtle chemical changes ultimately yield the distinctive wine character. During fermentation, care is usually taken to control the temperature and to prevent contamination.

After the sugars have fermented, the wine is racked off (removed from) the pomace. The residue (lees) is next removed from the fermenter and pressed to recover remaining wine. Then, depending upon the product desired, the wine may be sweetened, or blended with other wines.

Pasteurization follows. This heat-treatment accomplishes three things: (1) Coagulates colloidal particles to facilitate subsequent filtration, (2) kills any remaining wine-harming bacteria, and (3) heat-stabilizes the product.

Next step is chilling the wine to precipitate tartrates and to cold-stabilize the product. After the wine is stored and properly matured, it is polished by filtration and bottled. Finally, bottles are capped, labeled, stamped, and packed into cases.

Some major advances have taken place in winemaking within recent decades. Precipitation of tartrates and other settleable solids (formerly a time-consuming, "let-nature-take-its-course" procedure) can now be accelerated by chilling wines below 25 deg. F. in heat-exchangers. These same heat-exchangers also serve as pasteurizers, thus accomplishing in a matter of seconds what takes nature a long time.

Also, properly made wines are allowed to clarify—slowly during storage, or by fining (clarifying) and filtration methods that have been introduced to speed this process. It is also to be noted that advances have been made in grape-crushing and pressing operations.

But the fact remains that changes of major importance have been too few.

We, at the Mogen David winery, are keenly aware of certain inefficiencies in winemaking technics. As a result, our company is now constructing a special laboratory with the express purpose of devoting time to a number of projects that may give impetus to broader and quicker changes in our industry.

For example, we feel the need of stepping up fermentation. If the metabolic action of the wine yeasts are responsible for the conversion of juice into wine, then it does not appear unwarranted to assume that an increase in the number of yeast cells may, within limitations, result in more rapid conversion of sugars into alcohol and carbon dioxide. Excess generation of heat during fermentation can be controlled by using cooling coils.

Suggested Improvements

A method for propagating adequate amounts of selected wine yeasts can be borrowed from the yeast manufacturers. In fact, it may be possible to form these yeasts into relatively dry cakes, and then store them under refrigeration. Why not start fermentation by dropping a few cakes of pure yeast into sterile juice and maintain optimum fermenting temperatures?

Improving the grape-pressing operation is another project. Too much juice and grape-skin coloring are being lost in present methods. Today, two predominant pressing methods are employed—the hydraulic press (a batch technic) and the screw press (a continuous process). Our research laboratory proposes to investigate this problem and determine if an efficient continuous-pressing method, employing heat and vacuum, can be developed.

We are also looking into the problem of effectively concentrating juice through means of refrigeration rather than evaporation. Perhaps this can be done by freezing the water in the juice and then separating the ice with the aid of centrifuges.

Also under investigation will be a suitable method of canning wines. Some years ago, this process was undertaken, but the results were unsatisfactory. It is believed that these experiments were limited and poor quality wines were used.

Instead of employing chemical or heat-sterilizing technics (particularly when the latter might scorch the wine), ideas have lately been circulating as to the possibilities of treating wines by electric shock to kill microorganisms. Such experiments are also contemplated.

Ageing involves the expenditure of valuable time. Since we desire the effects of ageing on wines, a stimulated search for short-cut ageing methods appears in order.

Diatomaceous earth is frequently used as a filter aid to remove suspended solids from wine—a mechanical process. In some cases, fining agents with electric charges opposite to those of the suspended particles are used to clarify wine. Neither method has undergone any principal change.

Is there a better way of clearing up wines? We intend to look into the possibilities.

In substance, the overall program of our new research laboratory is to reappraise winemaking from beginning to end as it is performed today—to lay out a flowsheet depicting established unit processes and to question our dependence upon each one.

Certainly, there is no reason to adhere to a system of operation simply because it is old or even because it is tried and proven. It is evident that we must continually be critically appraising—seeking out the faults and looking to improve the efficacy of what we are doing. Otherwise, we cannot expect to progress and thus keep pace with this fast-changing world.

Into the Future

We aim for certain ideals. In fact, if we may do some conjuring about what winemaking will be like in the year 2052—with the assumption that progress in our industry will have caught up with the advances in other fields—this is the dream. . .

. . . . . .

(Slight Pause as 100 Years Go By)

. . . . . .

z . . z . . z . . that might come before our inner eye: Except for a few minor viticultural changes involving hybridiation and soil renewal, grapes are now grown much as they were back in 1952. Since 2042, however, artificial weather-control devices have begun to show promise in warding off frost in the southern fruit belt. And new rainmaking units have been successful in preventing drought in the wheat belt.

Both types of equipment are now being used to a limited extent in the California and New York vineyards, and grape growers in Oregon, Washington, Michigan, and Ohio are watching the outcome with much interest.

Because of the increased demand for grapes, vineyards are entirely inadequate. Hence, the thousands of new vines that have been planted since the turn of the century in 2000 and the new tonnage now obtained per acre have hardly matched the increased demand. Not only are grapes used for the table, but demand for grape-juice drinks has mounted. Wines, too, have really come into their own, and the new grape foods are finding favor.

Now, the agronomists are attempting to grow giant grapes in thicker clusters, and one of the agricultural equipment firms is experimenting with a special method of "saw-toothing" the terrain. Land is heaved at a 45-degree angle in multiple rows and reinforced underneath so it will not collapse. Altogether, the results suggest that before long the growing surface per acre will be nearly doubled.

Of course, the winery is now truly the hub of the vineyard. It is an oval-shaped structure that is about 500 ft. long, 250 ft. wide, and 50 ft. high. Sides of the building have wide ramps, spiraling upward to the hard-top roof.

Along the ramps, evenly spaced, are dozens of truck-size doors. Above the ramp, and winding with it, is the overhead monorail of the public freight system. Around the rim of the roof are the loading elevators handling incoming and outgoing air cargoes. Surface roads fan out into the vineyards and onto the superexpressway near the winery.

Continuous Flow

Actual operation of the winery starts directly with the picking of the grapes. Mechanical pickers are employed. Mobile equipment goes out into the vineyards, and the grapes are spot-processed into juice. Pipe lines carry the juice directly to the winery. Mobile concentrators in the field dehydrate excess juice to one-third of its original volume. Concentrated juice is stored, later to be used to level out production.

Juicing equipment is designed to utilize the dry pomace residue for fuel, once the system is in operation. Principle of the juicing equipment is simple: Grapes deposited in a high-vacuum chamber are exploded. Pomace then goes into a second chamber, where it is sifted to remove pits, stems, and other extraneous matter. A third chamber subjects the pomace to high pressure, much the same as that generated in a gasoline engine.

Here, the pressure raises the temperature to 200 deg. F. At the same time, a piston forces the juice through a screen at the bottom of the cylinder. The upward surge of the piston dislodges and sucks up the dry pulp to expel it through a port near the head of the cylinder. The cylinder is then ready to repeat its cycles. Expelled dried pulp falls into a hopper, from which it is discharged into the fuel chamber and then ignited.

In making a concentrate, the juice is directed to a vacuum flask, where the temperature is reduced and the frozen water flaked off. The whole process—from picking of grapes to extracting or concentrating the juice—takes only a few minutes, and waste is at a minimum.

Inside the plant, we note that the winemaking processes of 2052 follow one integrated movement. Juice or concentrate enters at one end of a large revolving columnar generator, which is 300 ft. long and 30 ft. in diameter. Alcoholase, the enzyme which converts sugar into alcohol, is fed into the generator, and action is immediate.

This alcoholase is produced from separate cultivators, and it is extracted under pressure from the yeast. However, research recently launched (2048) now shows promise of disclosing methods of synthesizing alcoholase, and it is likely that the yeast cultivators will soon be eliminated.

Various gases are bubbled through the juice to simulate the natural changes which normally take place when grape juice is fermented. Flow meters and temperature recording instruments control flow and temperature of the juice. Reaction heat is carried away as fast as it is developed.

If the wine must be sweetened, liquid sugar is pumped into the column. Addition of blending materials is regulated by means of pre-set controls.

At a lower stage in the flow, one section of the column is refrigerated and another section is heated to climatize the wine. The flow continues through a series of self-renewing filter plates to insure clarity. Sterile bottles are filled, sealed, quickly bottle-pasteurized, and cooled. Bottles are finally bound and stacked.

The continuous process is minutely synchronized, taking less than a day. No outside apparatus (other than that which is used for surplus storage and yeast cultivation) is required. If, however, it is necessary to store wine in bulk, a separate step of wine-dewatering is employed by means of fractional distillation. The alcohol, which comes off early, is trapped and held aside, later to be restored. This method reduces the volume to approximately one-third, and it makes possible the economical storage of wine in the form of wine concentrate.

Heat removed from the refrigeration section of the columnar generator is directly applied to the heating section below. No other heating or cooling agents are used. The method of heat transfer again involves vacuum and pressure. Additional motive power is, of course, obtained directly from the sun and stored. A sufficient reservoir is maintained to provide power for cloudy days.

Special Bottling

Bottles are made of transparent plastic, with the labels infused into their molecular structure. The cap contains a sealed CO_2 charger, which keeps air out as a safeguard against spoilage. Attached to the cap is an adjustable pouring device. When the bottles are filled, they are bound together by means of a band rather than packed into cartons. Stacking and loading are completely automatic, robot controlled.

We learn that this winery of 2052, with its special time-saving equipment, works only a 4-hour day, 4 days a week. However, the amount of wine produced here in this 16-hour work-week is equivalent to the volume turned out back in an efficient 1952 winery, which industry history notes was 20 times its size and operated 40 hours a week.

Distribution of bottled goods is by truck, monorail, and air freight to the main metropolitan centers. Although there are still a number of state-controlled retail outlets, most purchases are based upon family subscription, and delivery is on a house-to-house basis, along with milk, eggs, and other household staples.

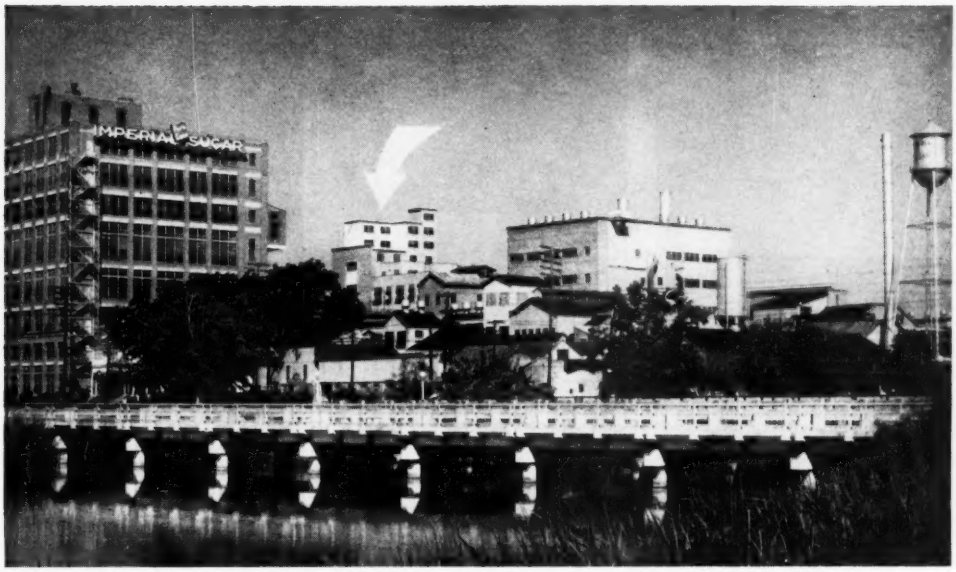
Better Wines

The wine itself has undergone marked changes in the hundred years since 1952. There is no question of stability or uniformity. Flavor, aroma, consistency are psychologically as well as biologically adapted to the consumer. Extensive surveys and experiments precede the introduction of any new wine product into the market. The criteria are the native consumer preferences—with the "reaction ratings" all pre-tested and pre-proved. High-pressure is not employed to force an inapplicable or objectionable wine upon the public.

General advertising here in the mid-21st century, has ceased to be "a barrage of persuasive ballyhoo." It has toned down to a gentle form of suggestive communication prepared from the consumers' point of view.

As for wine, instead of finding advertisements insisting that the product is "the best" or "the most popular", the announcements (regardless of the medium) strive to focus in-

(*Turn to page* 206)



HEART of Imperial Sugar's integrated, multi-building refinery is new packaging-facility building (arrow).

ULTRA-MODERN PACKAGING Proves Prime Efficiency Booster

New synchronized system gets the accent in Imperial Sugar's multi-million dollar modernization at Texas refinery—and quickly wins notable savings

L. E. SLATER
Assistant Editor, "Food Engineering"

In almost every food plant, packaging takes a pretty stiff bite out of total production costs.

Hence, Imperial Sugar Co. paid particular attention to packaging needs when, with $4,000,000 to spend on expansion and improvement, it modernized its 2,000,000-lb.-capacity Sugar Land, Tex., refinery.

Construction of completely new facilities for putting up the products was a focal point in the company program, which was carried out under the direction of Vice-President W. H. Louviere, aided by B. Varnau and A. Weth.

And the new set-up does more than accommodate the added product capacity—it also is chalking up unusual savings in strong contrast to previous costs.

A great many visits to packaging rooms in far-flung plants preceded drafting of final plans for Imperial's new facility. Today, the visits are in reverse—for Sugar Land has become a Mecca for those who wish to see the last word in operations of this type.

Among the many innovations that the watchful visitor spots are—

» **Unimpeded, automatic movement of pan-house sugar to the new sanitary design, packaging surge bins that afford 2,000,000-lb. capacity.**

» **Central panel control of all sugar flow from bin to conveyors, screeners, hoppers, and packers.**

» **A completely air-conditioned consumer-package area utilizing color dynamics and sanitary construction details.**

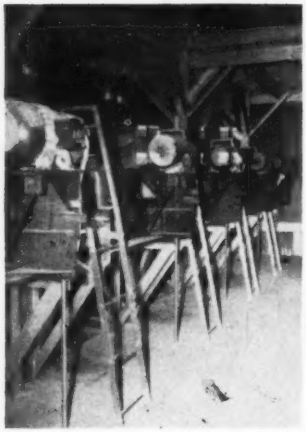
» **An integrated, "free-wheeling," package conveying system that flexibly "meshes" with all the warehouse and shipping conditions.**

Before tracking down these and other fine points, a brief look at the building housing the packaging operations is in order.

Actually, the new packaging building—which has five main floors and occupies a 100x100-ft. space—was remodeled from its wooden, three-story predecessor. The old structure was virtually re-built. It was completely reinforced and faced on its south side with 8-in. red hollow tile to insulate and enhance its appearance. Also, its north wall is now enclosed in corrugated iron. The two remaining walls are still common to adjoining buildings.

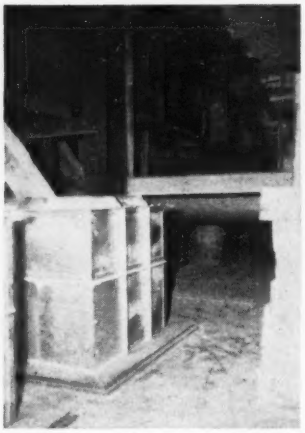
In the new building, a penthouse-like fourth and fifth floor and a tower project above the old levels. Special pre-packaging operations for a bakers

Screens



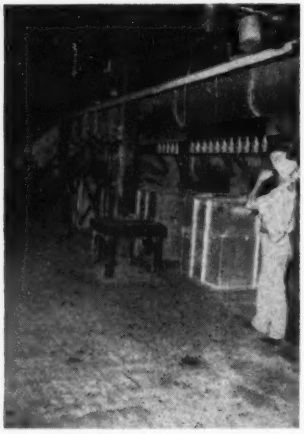
CRYSTALS are sized by first passing through these Rotex gyratory screens.

Movers



SUGAR from storage bin (upper right) is moved by screw to packaging bins.

Interlocks



VIA signal panel, operator can mesh sugar flow with work on floor below.

sugar take place on the two added floors. And the tower houses the huge packaging surge bins which are fed from the nearby pan house.

The third floor level primarily contains a conveyor system that discharges the surge bins and distributes sugar through hoppers to various packaging operations below. Empty cartons and bags from an adjoining storage building are also received on this floor and chuted below.

Packaging Environs Unusual

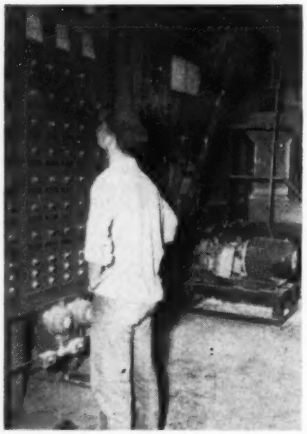
All packaging takes place on the second floor, and under ideal conditions. The space is completely air-conditioned to 70 deg. F. and 50 deg. F. wet-bulb. Lighting for the area is recessed, at short intervals, in an acoustical tile ceiling. Walls are made of attractive, easily cleaned Formica, and the floors are of unfinished maple.

Most striking aspect of this area is its use of color dynamics. All walls have a light green finish, with woodwork a slightly lighter shade. Machine bodies are a basic green, with all moving parts painted a plum color. Conveyors are ivory tinted, the ceiling white, and the floor a natural color.

Several other buildings are associated with the main packaging structure. Three of these are adjoining fire-proof warehouses served by the same railroad siding. Also, a separate two-story building was erected for controlled-atmosphere container storage. This latter unit, termite proof, is of hollow-tile, concrete construction.

A unique feature of the Imperial operation is that while processing goes on around the clock, packaging operations are only on a two-shift basis.

Controls



MASTER distribution control of sugar movement is exercised from this panel.

This required installation of two stainless-steel-clad, white sugar, storage bins in the packaging house. Acting as surge tanks, these two sanitary units assure non-stop efficiency in packaging, even during times of temporary plant shut-down.

Conveyors Take Over

Granulated white sugar is bucket-elevated from pan house to top of the packaging building tower. A screw conveyor then sends it into a Rotex distributing conveyor feeding five Rotex gyratory screens. The bulk of sugar —with properly sized crystals—is then fed below into two 1,000,000-lb.-capacity storage bins occupying about two levels of tower space.

Scalper screenings from the Rotex (crystals retained on 8 mesh) are sent back to the pan house for remelting and return to the process. Fines from the screening, however, are conveyed to a smaller stainless steel tank—called the "Bakers Granulated Bin"—located between the large storage units.

Sugar is pulled from storage by a Syntron vibrator and bin discharge conveyor. A bucket elevator then takes it up one floor level to a Hummer distributing conveyor for passage through five Hummer screens—a lump and powder removing operation. Suitably sized crystals then enter the hopper distributor conveyor system on the third floor, or drop directly to 100-lb. valve packing machines. Screenings are again sent back—via a scalping conveyor—for remelting.

Centralized Control

All distribution operations are monitored by a central control panel adjacent to the storage bin discharge system. Lights at this station show which conveyors and feeders are running. Also, the level in each hopper is signalled by means of Bindicators. A bank of pushbuttons by these lights furnishes controlling action.

Another signal light station, duplicating certain indications on the main panel, is located midway along the hopper distributing conveyor that feeds sugar to various packaging machines on the floor below. Signal lights in this bank also tell which packaging machines are in operation. Thus, a man at this station can coordinate distribution with actual packag-

ing—using a nearby phone for communication.

"Bakers Granulated," or powdered sugar, can travel three routes from its storage. It can be directly chuted to a screw conveyor and open mouth hoppers for straight packaging. Or it can spout to a cross-conveyor that will move it into the main granulated distribution system.

But the bulk of powdered product is bin discharged through a 5-in. horizontal Redler conveyor and thus delivered to a B. F. Gump dry-feeding sugar and starch proportioning system. Here, the special bakers product is formulated, then moved and mixed by a discharging screw conveyor. The product then travels through two pulverizing mills and a multi-pass aerating conveyor before depositing into pre-packaging surge hoppers.

Packaged Sugar Flow

Third floor conveying activities distribute sugar into 20 hoppers of various capacities—all projecting down into the air-conditioned packaging area below. Brown sugar is brought over from the pan house and hopper-deposited on the second floor.

Discharge of hoppers through powered gates is dictated from each packaging operation. All sugar is automatically scaled before filling—Richardson units being used throughout.

Most striking packaging operation visible is the compact group of six parallel Delta-Seal lines funneling into four Standard-Knapp packers. Four of these lines fill 5-lb. Bemis multiwall bags at a 45 per minute clip. The other two handle 10-lb. bags at 40 per min.

How It's Done

Activities in each Delta-Seal line are well meshed. Sugar passes from its hopper through a scale and into the bag feeding and filling machine below. Filled bags then travel down a shaking conveyor to a closing machine, where each top is glued. The bags then invert and pass along a sealing and drying conveyor. Next, they converge from two lines and are packed into 60-lb. bales by the Standard-Knapp unit. Union Special machines automatically sew the bales, which finally chute to warehousing below.

Prior to this automatic installation, all packing of small bags called for manual filling and hand sewing. Four such lines are still retained, but they are only used to augment production during rush periods. Maximum output from the manual operation is about 30 of the 2-lb. bags per min., with two attendants working at top speed.

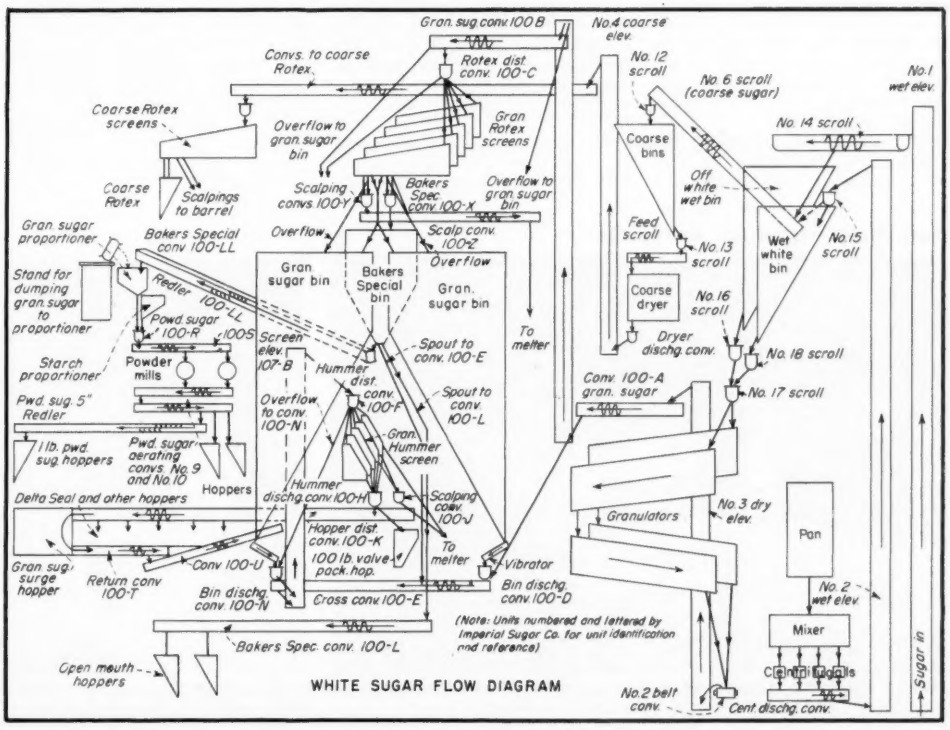
One-pound wax-paper lined cartons of brown and powdered sugar are put up by four Pneumatic Scale packers. Actually, two such machines comprise a single packaging line, which is served by a double package maker and a rotary top closer. Placement in a shipping carton and sealing via a Ferguson unit finishes the operation.

Speed of 1-lb. packaging is 60 per min. for powdered and 40 per min. for brown sugar. The latter requires a special manual paddling in the filler bowl because of its tendency to cling. Lumps in the brown sugar also necessitate a special check weighing—performed automatically by a Winter Engineering unit that is claimed accurate to a fraction of an ounce.

Individual Servings

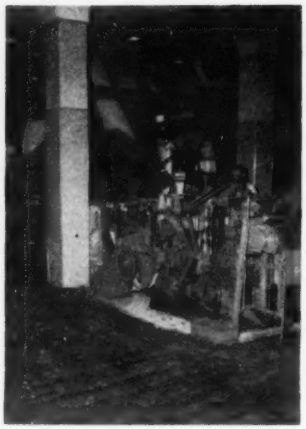
Recently introduced in the packaging room, a Stokeswrap individual-serving packager turns out 70 of the ¼-oz. wax-paper wrapped, crimped-end packets per minute. It supplants

Graphic Details of Sugar Lines



PACKAGING: From Individual Servings . . .

INDIVIDUAL servings are turned out 70 per min. by Stokeswrap unit.



POUND WHITE packages are put up on lines of Pneumatic Scale packers.

POUND BROWN units get a special check-weigh since this sugar lumps.

an old hand-filling system (which had less than half the capacity, plus an annoying gluing problem).

In addtion to small package lines, several 100-lb. filling units function in the packaging area. Two of these are St. Regis "shifting-tube" packers handling tuck-closure, multi-wall paper bags. Capacity of these automatic packers is six bags of granulated sugar per minute. Two other 100-lb. St. Regis valve pack machines are also used—one for coarse and sanding sugars, and the other for powdered product.

With all this packaging activity crammed into a 10,000 sq. ft. area, one is surpised at the cleanliness and orderliness of operations. Of course, the air-conditioning, color dynamics, and acoustical ceiling all contribute to the spic-and-span impression. But the real answer is the logical area layout and a rigid system of housekeeping.

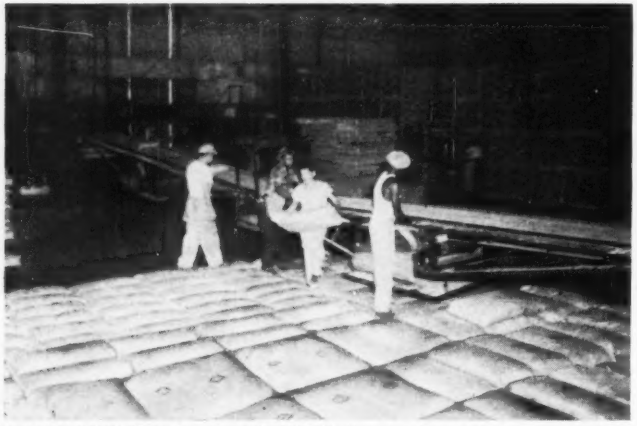
Easy Cleaning Access

First of all, the packaging lines are installed in parallel fashion with considerable unimpeded aisle space allowing easy cleaning access. Then, too, the Formica walls and columns are dust shedding and sparkle when wiped down.

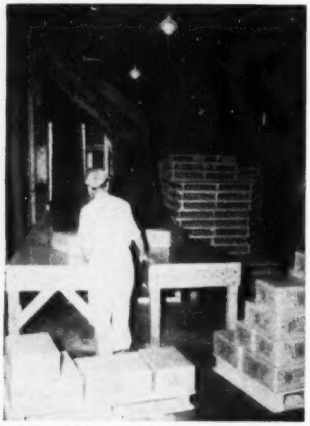
But the constant use of a rotating-brush vacuum floor cleaner (Finnel System) clinches the matter of housekeeping. This mobile unit is provided with an extra-length electric cord reel that allows it to roll into all parts of the packaging floor. It does an excellent job of sucking up the finest mesh dust.

Air conditioning of the area has many concrete advantages besides its contribution to good housekeeping. Its primary purpose at Imperial—because of the humid coastal climate—is to trim moisture in the product and provide a cleaner, better-sealed package. Machine jamming due to sticky cartons has also been virtually eliminated by the controlled atmosphere. And, of course, the pleasant atmospheric conditions have their usual

Handling Finished Products

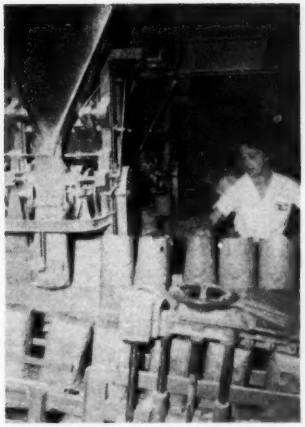


CROSS CONVEYOR is served by distributing conveyor (rear) in warehouse. It can be hoisted to allow piling of sugar packages below.

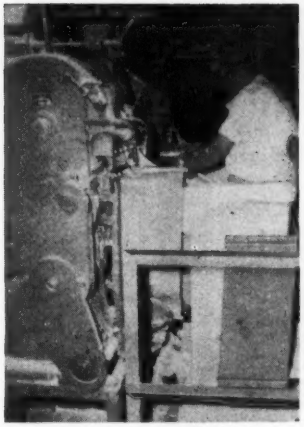


CARTONS of 1-lb. units are chuted from packaging floor for palletizing.

TWO & FIVE-pound hand-filling and sewing units augment production lines.



FIVE & TEN-pound bags are filled at 45 per min. on six Delta Seal lines.



HUNDRED-pound multi-wall bags are filled 6 per min. by St. Regis unt.

upgrading effect on personnel performance.

Refrigeration for air-conditioning is furnished from a special 100-ton capacity compressor room located on the first floor. Four Chrysler "Airtemp" radial compressors, driven by 50 h.p. Allis-Chalmers motors, provide this capacity. Air filter and washer for the system are located on the third floor, connected by ductwork to the packaging floor below.

Controls (Johnson Service) regulate three air zones in the packaging area. Thermostats and humidity regulators, spotted by three of the return air grills, pneumatically position louvers in the air supply ducts to maintain desired conditions. In addition, the control system takes advantage of any cool or low humidity outside weather by automatically pulling it into the system through the use of an intake damper.

Integrated Materials Handling

Another striking packaging aspect is the apparently effortless way both empty and filled containers appear and disappear from the scene. It's not sleight-of-hand—it's simply a prime example of how well-planned materials handling can do a seemingly impossible job.

Take the "empties"—the bags and containers that are needed to supply the twenty-odd filling stations. These are palletized in the container storage building and transferred to its second floor by a Towmotor fork truck. A 30-in. belt conveyor then moves this material to the third floor of the packaging building and a collecting table. Hand trucks are then employed to move the containers to chutes serving various machines on the floor below.

Then observe the non-stop movement just below the battery of package chutes on the warehousing floor. Here, a network of four 30-in. overhead belt conveyors, running parallel and crosswise in the area, remove the bales and 100-lb. bags coming down from various packaging lines and machines on the floors above.

Distributing Conveyors

At the end of the space, running along the north wall of the building and at right angles to the first belt network, are two 30-in. belt distributing conveyors. One of these runs inside the building and on through the three fireproof warehouses. The other goes under a shed on the outside of the building and supplies both the train loading dock and truck facilities at the extreme end of the third warehouse.

In the three, high-ceiling, brick and steel warehouses, special company designed cross-conveyors remove packages from the distributing conveyor for palletizing and storage. These are swivelled in two sections and can be hoisted up—yet still function—to ease traffic and accommodate storage piles that are building up. These mobile belts are also reversible, hence can be used for pile unloading.

Simplifies Cleaning

FLOORS are kept spic and span by Finnel System brush-vacuum unit.

Unit-Load Principle Used

Cartons of 1-lb. brown and powdered sugar are handled a bit differently. These chute down to tables below and are stacked 40 to a wooden pallet. A Towmotor truck then tiers them two pallets high in the same area. However, such cartons can also move to the three external warehouses and be tiered four pallets high.

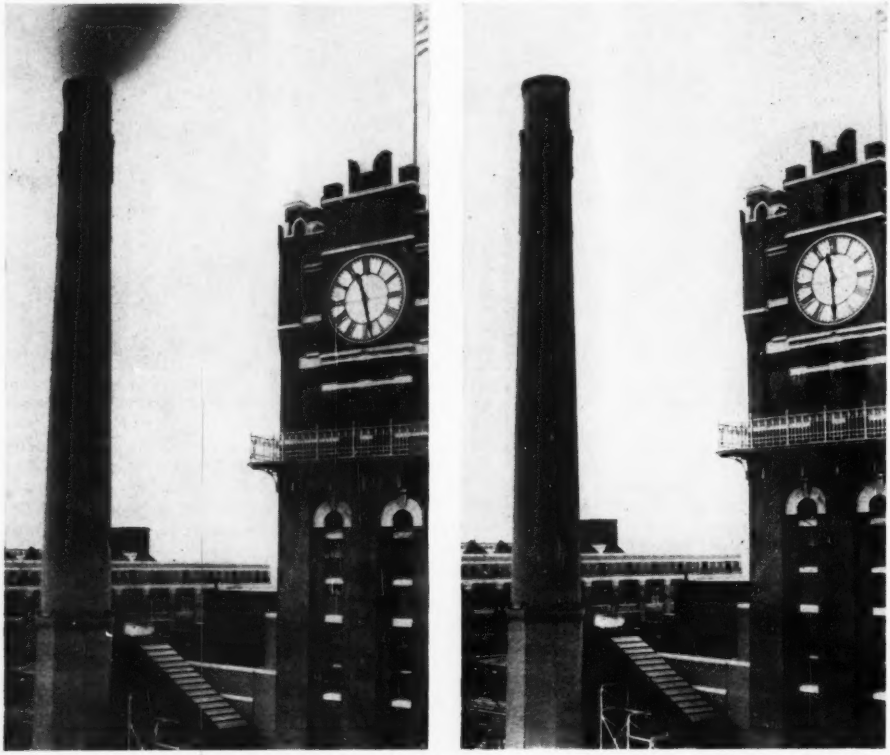
While the unusual cleanliness and lack of manual handling in the Imperial packaging set-up may be termed exemplary, the company is still carrying on plans to improve and add to the operation.

For example, to achieve further restriction of dust in the packaging area, all fine powder operations will soon be restricted to a separate sealed room.

Also, new equipment is being installed to further mechanize the handling of coarse and powdered sugar during its course of flow before it reaches the package.

Clock Shots Prove Speed of New Unit

—As Smoke (11.28 A.M.) . . . **. . . Vanishes (11.30 A.M.)**



CAMERA catches clearing of Anheuser-Busch stack No. 5 on day of new equipment's installation, July 6, 1951. System went into action just after photographer snapped "before" picture (left). And smoke was gone by time he got "after" view just 2 minutes later (right). New unit can be seen at lower right of stack.

"Shock" Treatment
Solves Smoke Problem

When St. Louis set up a new—and tougher—anti-smudge ordinance, Anheuser-Busch met it squarely with simple electrostatics. System quickly precipitates the brewery's fly-ash to a mere quarter of the figure red-lined by the code

FE STAFF

Advanced engineering is now making new strides toward keeping smoke—the air-contaminating offshoot of industry—out of our city atmospheres.

Yesterday, this nuisance was bad enough to bring civic policing action. But today's heavier smudging has finally led municipalities to declare full warfare.

Under the stimulus, combustion engineering has now been developed to the point where it is claimed any fuel can be burned smokelessly in a properly designed furnace with suitable equipment.

Such an approach, however, would be an epic undertaking in many established food plants. Replacement or re-engineering of boiler and draft systems

can entail an outlay in capital dollars that is prohibitive. True, it would be ideal to treat the problem at its source. But there is no sense in "killing the patient" while doing it.

Anheuser-Busch in St. Louis, with an in-city location and one of the largest power generating plants in the food industry, faced this problem in 1940 when the first St. Louis Dust Emission Ordinance went into effect. This restricted emission of stack fly-ash to a maximum of 0.75 gr. per cu. ft.

The company met this 1940 ordinance without resorting to drastic overhaul of the five pulverized-coal-fired steam generators—by installing low-draft-loss mechanical separators of the multiple louver type. Fly-ash was thus cut well below the ordinance figure.

However, the subsequent progress made in clearing the air spurred St. Louis to write an even stricter ordinance. Passed in 1948 and effective in 1950, the new ruling was patterned after the ASME Model Smoke Law, limiting emission to 0.75 lb. of dust per 1,000 lb. of flue gas at 12 percent CO_2.

The brewery's mechanical collectors were doing a good job at the time of the new ordinance—but they could not approach the tolerance in fly-ash removal. Further, it was impossible to increase the efficiency of this equipment to meet the full terms of the ruling. And though different equipment of the mechanical type could have been installed, this would have brought a draft loss beyond the compensating capacity of the existing fans.

New Type Precipitator Used

Because of the costs of revision in boiler-draft systems and Anheuser-Busch's desire to go well beyond the new ordinance, company engineers de-

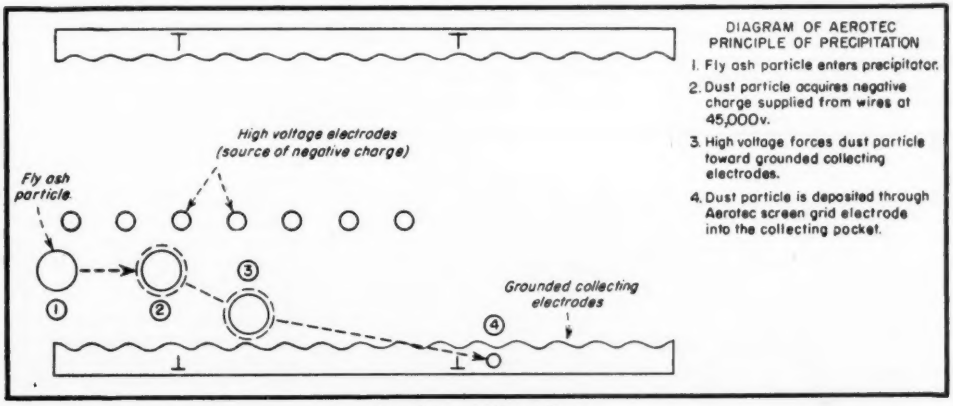
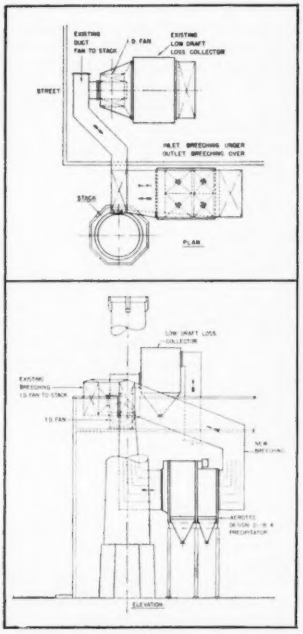


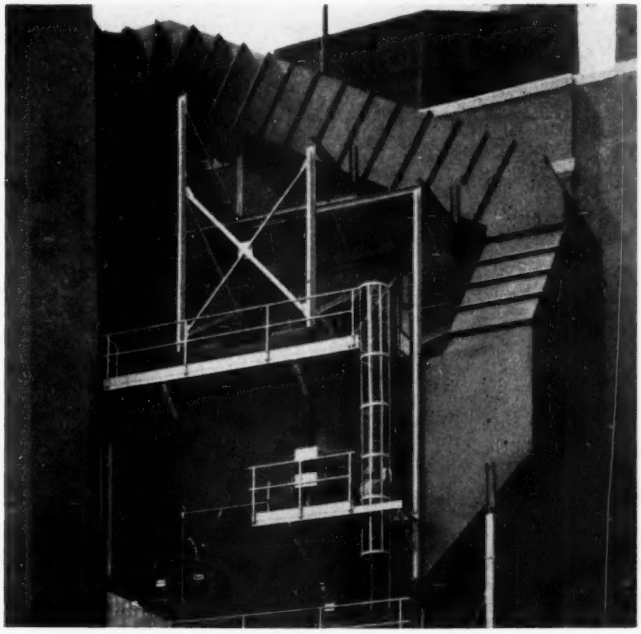
DIAGRAM OF AEROTEC PRINCIPLE OF PRECIPITATION

1. Fly ash particle enters precipitator.
2. Dust particle acquires negative charge supplied from wires at 45,000v.
3. High voltage forces dust particle toward grounded collecting electrodes.
4. Dust particle is deposited through Aerotec screen grid electrode into the collecting pocket.

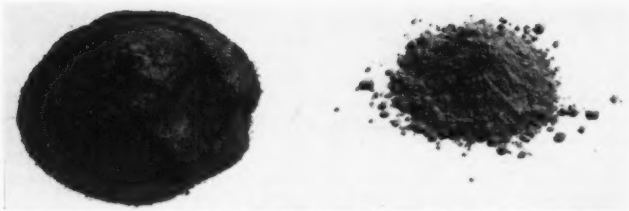
Principle of Operation



Plan



Unit Closeup



STOPPED from emission is light fly-ash (right). Old mechanical system merely removed heavy particles (left).

voted considerable study to an effective and economical solution of the problem. Subsequent decision was to install a new type of electrostatic precipitation equipment on one boiler.

The new equipment was planned to augment the action of the existing low-draft-loss collector, which would remain in service. And from results, it could be decided how the four other boilers should be ultimately equipped.

In April 1950, a contract for the precipitator was awarded to The Aerotec Corp. of Greenwich, Conn., and detail designs were immediately drafted to adapt the principle to the No. 5 boiler draft and stack layout. The arrangement required that the unit be supported on a structural steel platform halfway up the side of the boiler house. A splitter diaphragm was provided in the existing stack breeching to direct the gases downward into the unit and then upward in an outlet breeching to the former stack connection.

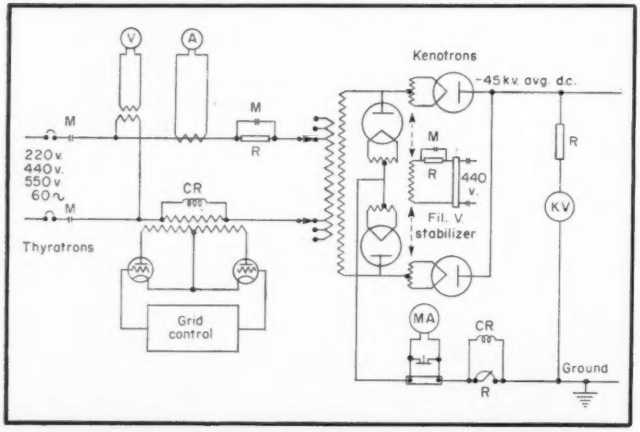
On July 6, 1951, the new installation, costing a total of $145,000 was put into service. And in only the interval it took to click a camera shutter—see leading photos—it dramatically proved its worth by completely eliminating any visible trace of fly-ash from the once smoking stack.

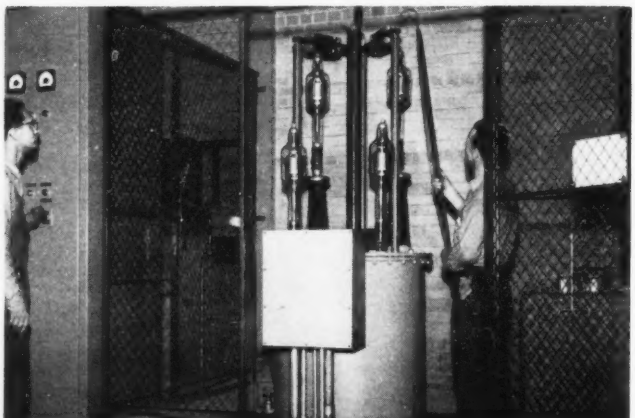
Here are the facts on what the system accomplishes: Average steam load of the boiler involved is about 200,000 lb. per hour—consuming about 25,000 lb. of 200-mesh pulverized coal. The coal burned has an ash content of about 10 percent, and 80 percent of this ash leaves the boiler in the flue gas. Thus, approximately 1 ton of fly-ash passes to the dust collectors per hour.

Together with the existing mechanical unit, the overall collection efficiency has now been raised to approximately 98 percent. Roughly 500 lb. of ultra-fine fly-ash is pneumatically removed from the hoppers of the Aerotec precipitator each hour.

■ **As a result of this installation, the total amount of fly-ash currently emitted from the stack in a 24 hr. day at full load is less than that formerly expelled over 2 hr.**

With this new unit, Anheuser-Busch has taken a long stride toward discarding the word "abatement" in favor of "elimination". For the severe 1948 ordinance "abates" fly-ash to 0.28 gr. per cu.ft., whereas the new technic has reduced the nuisance to an almost imperceptible quantity. Tests have actually shown that total dust emission is now down below 0.075 gr. per cu.ft. —roughly one-fourth that allowed by the code.





HIGH-VOLTAGE substation is located inside boiler house. In making maintenance check, operator stands at control station while man who enters first applies grounded pole as safety measure against any remaining charge. Top: Diagram of electronic rectifier circuit used in Aerotec precipitator.

How It Works

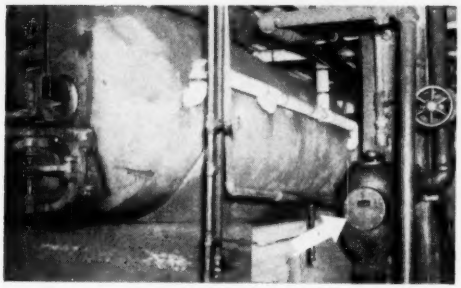
Electrostatic precipitation involves separation of dust particles—fly-ash—from the gaseous carrier by passage through high voltage fields. Here, the particles are negatively charged and thus attracted to positively charged collecting electrodes. The ash then deposits through a screen-grid electrode into a collecting hopper.

Actual design of this precipitator involves high voltage electrodes in three zones. Zone 1 consists of six wires operating at about 45,000v., full wave, d.c., average. Here, dust particles are given their maximum electrostatic charge.

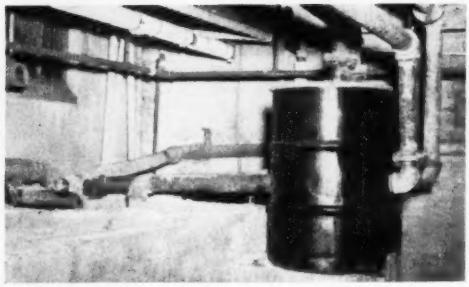
Zone 2 has a long flat plate (also operating at 45,000v.) which provides a uniform high-intensity electrical field

(*Turn to page* 205)

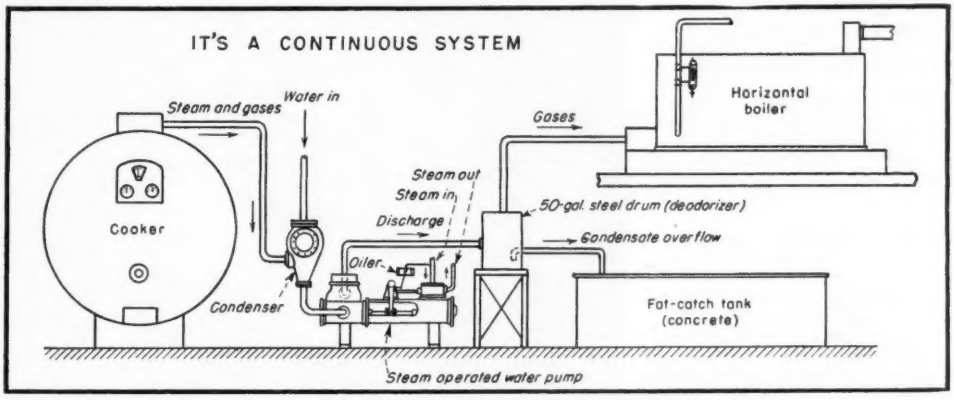
How Offensive Gases Are Controlled



FIRST, odorous gases and water-vapor are drawn from cooker (left) into one of condensers (arrow).



THEN gas and condensate go to these deodorizing drums. Later, gas is burned. Condensate flows to catch-tank (left).



Eliminates Odors From Cookers

Nuisance gases from meat packer's inedibles are dissolved

J. M. SAMSON
Plant Manager, Camp Packing Co., Cortland, N. Y.

We've been able to control unpleasant odors coming from the fat-rendering cookers, here at Camp Packing Co., by a very simple trick.

We pipe condensate and undissolved odor-creating gases from the cooker condenser to deodorizing drums. And the offensive volatiles that do not dissolve in the condensate at this point are burned or dissipated in our horizontal boilers.

Formerly, we pumped the condensate from the condenser into our sewer line. But the odors were not trapped in the sewer, and so they created a nuisance in and around our plant.

Here's how our simple odor-control system works:

Inedibles from the cattle-killing floor, boning room, and pork-cutting department are cooked in two horizontal steam-jacketed units. Capacity of each cooker is 6,000 lb.

Water vapor and volatiles coming from the cooked inedibles are vacuum-drawn through a 4-in. pipe from the dome of the cooker into a condenser. Employed is a steam-operated, large capacity water pump that pulls a 5 to 25-in. vacuum in the 4-in. line and the cookers.

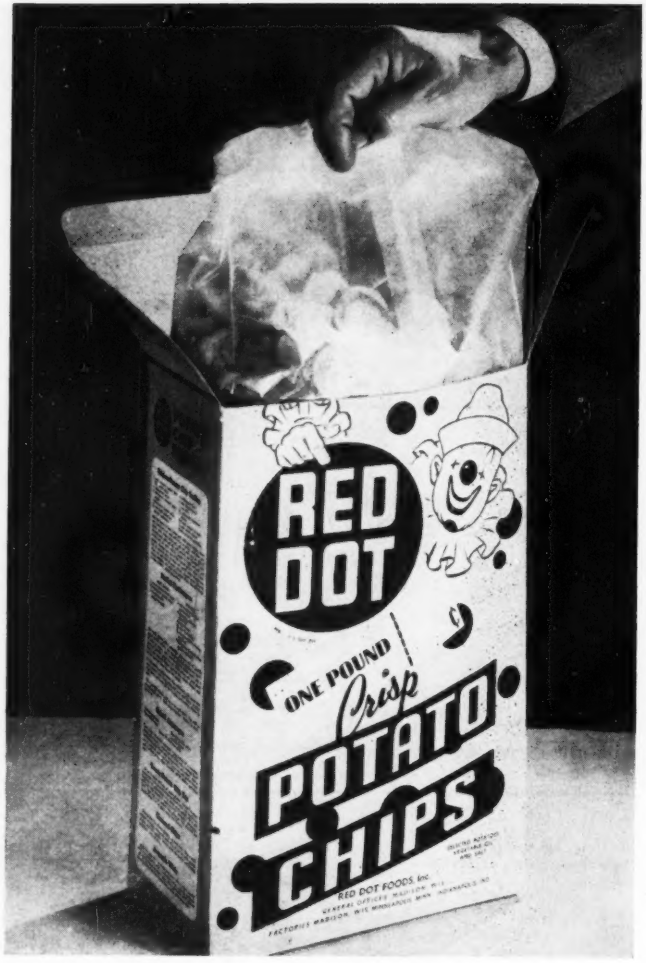
Water, fed into the top of the condenser through a 1½-in. pipe line, spray-condenses vapors coming from the cookers. Flow of water into the condenser varies to some extent with the vacuum pulled by the pump.

Gases Dissolved or Burned

From the condenser, condensate and undissolved gases are pumped approximately 125 ft. through a 4-in. pipe into a 50-gal. metal drum—our home-made deodorizer. At this point, those volatile gases that do not dissolve in the condensate escape through a 3-in. pipe in the top of the drum. These gases then travel about 150 ft. to the back of the fire-wall in our boilers. Here, these gases are burned or dissipated through boilers and smoke stack.

Condensate, when it reaches the halfway level mark in the deodorizing drum, overflows through a discharge pipe into a fat-catch tank.

Inedibles (tallow and meat scrap) discharged from the cookers are recovered and sold. Tallow goes to soap manufacturers. And the pressed and ground scrap is shipped to feed mills or fertilizer plants.



NEW "CHIPPER" package comprises a sealed waxed-glassine bag inside a simple folding carton closed by tucking. It extends shelf life of product.

Midwest potato chip maker wraps product contrary to precedent—and the new form wins high favor. Q.E.D.: The "different" ISN'T always handicapped by the "customary"

IVAN C. MILLER
Assistant Editor, "Food Engineering"

Acceptance

The "*Wrong*" Packages

A real poser faced Red Dot Foods, Inc., of Madison, Wis.—

The company lab had come up with a new package which would extend shelf life of potato chips several weeks—but it was not the familiar type of package normally purchased by the housewife seeking this product.

That was where Red Dot executives were in a quandary. To be sure, the newly developed containers gave greater assurance of freshness and flavor—yet they cut off the buyer's view of the product within. Thus they ordinarily would be considered "fundamentally wrong."

Certainly, before further consideration of such a radical departure from the accepted package, the answers to several straightforward questions were much in order:

1. Would the housewife "reverse form" and take to the new container right away? If not, would she eventually turn to it? Or would she simply shun it and keep on choosing chips put up in the conventional package?

2. How strongly would she react to the urge to "get more for less"?

3. Could she be sold on the idea of trying new table dishes made with chips, thus increasing the volume of product consumed?

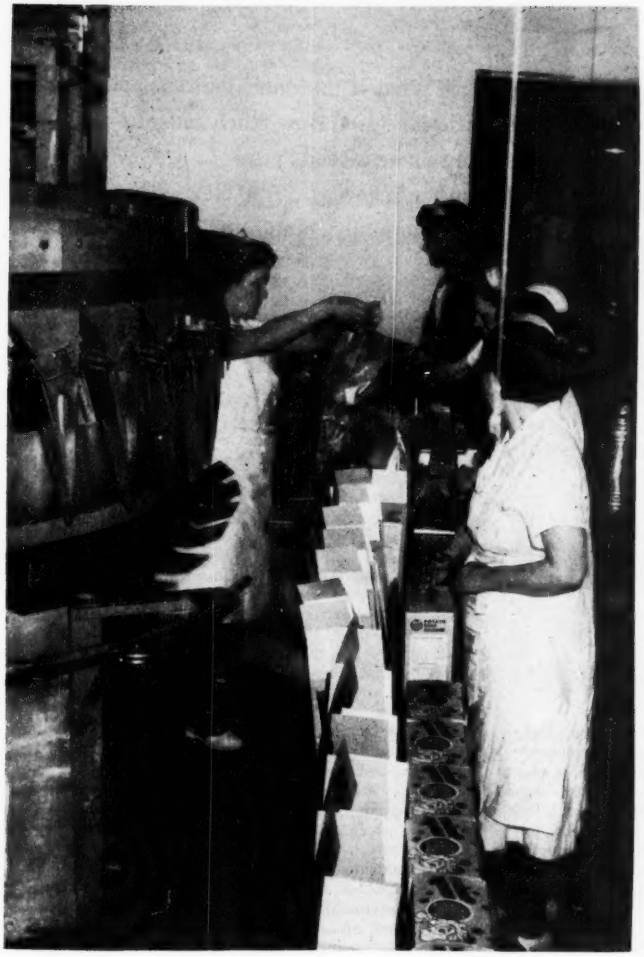
How she actually did react will be brought out below.

At the time the new type packages were tested, chips for the retail store were packaged in both single and double-wall bags made of waxed-glassine, cellophane, or laminated metal-foil. Package size ranged from less than 1 oz. to approximately ½ lb.

Old vs. New

Of course, the smaller the bag size, the less the margin for profit. For relative costs of both material and labor increase as size diminishes. Most chip manufacturers will agree from experience that they merely swap dollars (if they don't lose money) when chips are packaged in bags of 1 oz. or less.

The reverse applies as package size increases—total volume goes up and relative costs come down. However, unreined increases in package size can get out of hand—because as container volume is expanded, there is a proportionate rise in the chances of product staling after the package is opened. Nevertheless, a careful sales



TEST PACKAGES being hand-packed. Operator (left, rear) fills chips by weight into inner bags. Outer boxes come up in foreground.

Proves That

Sometimes Are *Right*

approach (quality considered) indicated the largest practical size the home-maker would buy—and continue to buy. A container to hold 1 lb. of chips was chosen.

Angles on Light

Laboratory tests revealed that an opaque package extended shelf-life two weeks or more beyond that of chips in the conventional packages that allowed light to enter. It was found that light accelerates the development of rancidity in the frying fat remaining in the chips.

The first light-excluding package tested in retail outlets was a round, 1-lb., lithographed tin container, closed with a slip cover. And in spite of its high cost—running 18-20c. each and necessarily included in the selling price—consumer acceptance was gratifying, sales volume rising higher than anticipated.

Next package market-tested was a tuck-closed folding carton with a 1-lb. sealed waxed-glassine bag of chips inside. When this carton replaced the metal container, the resulting lower package cost made it possible to reduce the selling price of 1 lb. of chips to 49-50c.

As soon as the new box was introduced, sale of chips in cans started declining. And immediately sales of the new carton began rising—to an extent proving the 1-lb. bag-in-carton package was satisfactory market-wise for chips.

Throughout the time when experimental runs were made, and until results brought either acceptance or rejection of the new package, temporary assembly expedients were employed. Chips were filled into glassine bags by hand, then check-weighed. Next, the bags were manually lowered into the cartons and the box closure hand tucked.

Advantages Detailed

One asset is shared by can and box. Both stack well to make attractive displays in retail stores. However, displays and other point-of-sale merchandising ideas are primarily first-purchase inducers—whereas repeat sales depend on freshness, taste, and the relative value of the product to the housewife calculated in nickels and dimes from her purse.

Accordingly, acceptance of the new carton, indicated by expanding sales, must also be credited to all of the following advantages—

1. Store displays can be erected more readily with cartons than with bags.
2. Shelf-life is extended two or more weeks.
3. "More-for-less" pricing is enabled by the higher volume of chips moved by the larger unit.
4. When a home-maker purchases chips by the pound instead of by the ounce, she is encouraged to find diversified uses for them in a variety of table-dishes (recipes for which are printed on the package), thereby enlarging family consumption.

¶ When is an imitation food really legal? . . . ¶ What if that machine fails to do 600? . . . ¶ Can you prove the seller said it? . . . ¶ How much can you "steer" your employees? . . . ¶ Does sealing make a food "pure"? . . . ¶ What's the "catch" if a trade-mark looks like the other fellow's? . . . ¶ New, yes—but can you patent it? . . . ¶ Will your mortgage really "stand up"? . . . ¶ And are you liable in that auto crack-up?

It's Wise to Know the Latest High-Court Answers—All Tersely Revealed in This . . .

LEGAL "SHORT COURSE"

LEO T. PARKER
Attorney-at-Law, Cincinnati

Here are revealing briefs covering a dozen recent higher-court decisions of particular significance to food processors.

These latest interpretations of laws affecting food plants and product handling invite scrutiny because the lessons they teach can be of specific aid in pointing the path which will avoid courtroom entanglements and possible fines.

Naturally, every situation is different. Accordingly, it is pertinent to observe the rulings in the light of the principles of the judicial thinking.

1—When an Imitation Food Product Is Legal

Makers of imitation jams and jellies may violate the Food, Drug & Cosmetic Act by inadvertent failure to meet established standards, or through use of improper labels.

Definitions and standards of fruit jams provide for not less than 45 parts by weight of fruit to each 55 parts by weight of one of the designated saccharine ingredients. Also, the soluble solids content of blackberry, strawberry, and grape jam should not be less than 68 percent, and of apricot, peach, and plum jam, not less than 65 percent.

Hence, a jam which does not comply is considered misbranded, although the product is labeled "Imitation" and it contains pure ingredients of high food value.

For example, testimony in a recent case (183 Fed. 2d 1014) revealed that the Government had seized and condemned 62 cases of assorted jam containing 55 percent sugar, 25 percent fruit solids, and 20 percent of a water solution of pectin. The product was labeled "Imitation Jam," and named the specific fruit. Below this appeared: "Made from 55 percent sugar, 25 percent fruit, 20 percent pectin, citric acid, and $\frac{1}{10}$ of 1 percent benzoate of soda."

Further testimony showed that many hotels and restaurants served these products as fruit jams, without disclosing that the containers were labeled "Imitation". Also, retail groceries advertised them as fruit jams and filled telephone orders on that basis. These jams looked and tasted like fruit jams, and had wholesome food ingredients.

The court held the condemnation valid, saying: "The jams under seizure contain fruit, sugar, and the other usual ingredients of fruit jam; they look and taste like fruit jam, and they are sold and served to customers as fruit jam. But they are a sub-standard jam even though labeled imitation fruit jam.

"We conclude that the jams were represented to be fruit jams, for which a definition and standard of identity had been promulgated. They did not conform to the definition and standard of identity. The manufacturer could not escape the impact of Section 341 and Section 343 (g) by labeling them imitation jams and by truthfully setting forth on the label the proportions of sugar, fruit, and other ingredients contained therein."

Another pitfall can be the label for imitation-type food products—even when the standards are met. The question has been asked: "Is it legal for a manufacturer of jams and other fruit products to sell imitation-type foods and just print on the label 'Imitation' or 'This product is an imitation'?"

Not according to a late higher court decision. For the Food, Drug & Cosmetic Act contains provisions that a food shall be deemed misbranded when imitating another food—unless its label bears, in type of *uniform* size and *prominence*, the word "imitation" and, immediately thereafter, the name of the food imitated.

2—Backing Up Performance

Higher courts hold that a seller impliedly guarantees that his product or machine will give reasonably satisfactory service in due consideration of the purchase price.

Take the following case (44 So. 2d 693): A salesman contacted the president of a food company to sell a dehydrator. Then the latter testified that the salesman reported his machine would handle 600 lb. of dehydrated potatoes per hour. On this basis the salesman got an order.

According to testimony, however, trials of the dehydrator after installation indicated it would only turn out an average of 451 lb. per hour of dried potatoes. And at such a rate it could not be operated at a profit. The purchaser refused to pay for the machine, and the seller sued to recover the purchase price.

Witnesses testified that they were present when the salesman said the dehydrator would handle 600 lb. per hour. Other testimony showed that the machine involved in this suit was one of the first of its type, and those made subsequently have been producing more than the stated capacity figure.

The court decided that the seller impliedly guaranteed that the dehydrator would produce a given amount of dehydrated potatoes per hour. As a result, the buyer was held entitled to a reduction of the purchase price based on the inability of the machine to handle the 600 lb. per hour.

3—Role of Witnesses in Verbal Contracts

Modern higher courts consistently maintain, in the case of verbal contracts or guarantees, that the party involved *must prove* his assertions with reliable witnesses, otherwise he cannot win a favorable verdict.

For illustration, in a specific case (69 Atl. 2d 177) it was alleged that a purchaser entered into a verbal contract with a seller for 500 cases of salmon at $20 per case, making a down payment of $1,000 and taking a receipt from the seller. There was nothing in the receipt indicating when the salmon would be delivered.

In subsequent litigation, the buyer testified that the salmon was to be delivered on or before December 1, and that when it was not so delivered he demanded, and was refused, the return of his down payment. He claimed the seller breached the contract by failing delivery on the verbally promised date, and that hence he was entitled to recover the down payment, plus damages.

The court explained that the buyer's contentions, as to the law, were correct. However, the jury refused to hold the seller liable on the alleged verbal arrangement, because (1) the seller denied he had promised such delivery, and (2) the purchaser did not introduce witnesses to prove the seller made such a verbal agreement. The court approved the jury's verdict.

4—Packers' Inspection Obligations

Our courts have always held that food packers are legally obligated to exercise reasonable care in inspecting their products while being packed, and to eliminate foreign substances that may cause injury to consumers.

For example, testimony in a recent case (64 Atl. 2d 525) brought out that a customer went into a grocery store and bought a glass jar of vacuum-packed coffee, and that when she lifted the coffee from her shopping basket, the jar exploded and her hand was severely injured. She sued the packer for damages.

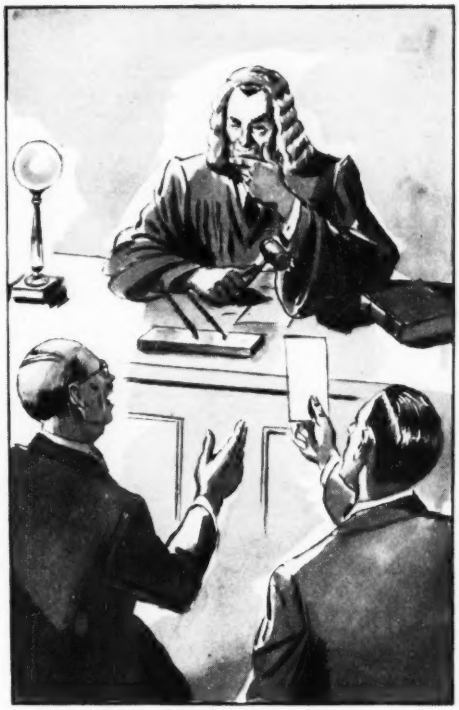
During the trial, evidence showed the explosion threw out fragments of glass, proving the explosion occurred from a force generated within the container.

In view of this testimony, the court held the company liable. "Coffee, being an inert substance, could not," it declared, have caused the explosion. Therefore something other than coffee was packed in the jar.

"Whatever the adventitious substance was, it had to have been placed in the container with the coffee before it left the defendant's plant. And it was the defendant's duty to use reasonable care to prevent any foreign matter from getting into the coffee. The evidence amply demonstrated that the foreign material was in the jar."

This court indicated that negligence of the company was presumed, since the company introduced no testimony to prove specific inspection.

In this respect, the court said: "Under the evidence, the only reasonable conclusion is that the accident was caused by the negligence of the defendant."



5—General vs. Limited Partnerships

Any financially responsible *general* partner is liable for all debts of a partnership. But the higher courts hold that a partner may limit such liability by recording a contract containing the specific limitation.

For example, in recent litigation (218 Pac. 2d 757) testimony showed these facts: A Mr. G., in company with several others, executed a contract known as "Articles of Limited Copartnership." This provided that the parties were associated in a firm for the purpose of processing fruits and vegetables. In this contract, Mr. G. was described as a limited copartner, with his liability restricted to $1,000.

The company, in the course of time, contracted considerable indebtedness. Suit was filed by the creditors against Mr. G. on the contention that he was liable as a *general* partner for all debts of the partnership.

However, in view of the facts that Mr. G. had signed the "limited" partnership contract and this contract was recorded in the local county court house, the court held Mr. G. not liable, saying:

"It appears to us that this man, not having intended to be and not having been in fact a general partner, should not be held liable for the debts herein involved."

The court explained that Mr. G. would, however, have been liable if the limited partnership contract had not been properly recorded.

6—Where Free Speech is Tempered

Considerable discussion has arisen as to what extent an employer is protected by the Constitution in making statements to his employees. According to a late high-court

decision, so long as the employer does not resort to coercion of his personnel, he will be on safe ground. Otherwise not.

For example, in one case (183 Fed. 2d 726), the testimony showed NLRB had directed a food company to cease offering "benefits" or "threatening reprisals" in attempts to discourage its employees from supporting a labor organization that was active at the shop.

Subsequent litigation proved that during a pre-election campaign for union de-certification, company officials had proffered certain employees benefits for a union defeat and threatened reprisals for a union victory.

The firm contended its manager had a right to express the company's opinion—the spokesman being protected by the First Amendment to the Constitution guaranteeing free speech.

But the higher court held in favor of the NLRB, saying: "The use of economic power over men and their jobs to influence their action is more than the exercise of freedom of speech. Mere suggestions, when made by one who holds the power of economic coercion in a setting conductive to the exercise of that power, may have the unwarranted effect of exerting a coereive influence to which freedom of speech does not extend."

7—Sealing's Role as a "Pure" Guarantee

The courts have recently ruled that packers of food that is sealed in cartons thus guarantee that the contents are pure and without foreign substances. This is unusual. Where food packages are not permanently sealed, the packer is not liable—unless, of course, testimony indicates negligence.

For example, a purchaser was recently in litigation with a dairy (220 Pac. 2d 257) on the contention that a dead mouse had been found in a sealed carton of milk, and here a higher court held the dairy liable for damages to the purchaser *without any proof* that the mouse got into the sealed package through negligence.

Therefore, mere finding of a foreign substance in the sealed package automatically presumed negligence. This is true for food products packaged in containers constructed to reach the ultimate consumer without alteration by intermediate parties.

8—A Legal Aspect of Trade-Marks

Higher courts hold that a company is not guilty of infringement of another's trade-mark if testimony shows that the public is *not* confused. This concerns products which might possibly fool the buyer into thinking they were the goods of another company.

In *Standard Brands, Inc. v. Eastern Shore Canning Co., Inc.* (172 Fed. 2d 144), the first-named company, owner of the registered trade-mark "V-8" for vegetable juices, sued the latter, contending infringement by use of the trade-mark "VA" upon tomato juice and lima beans.

But the higher courts refused to hold the canning company liable, declaring: "There is a marked difference in the appearance of the labels and trade-marks used by the respective parties, including their background, their coloring, and the arrangement of the printed matter thereon. Even the letters "V-8" and "VA," as printed on the labels, are decidedly unlike, both in form and coloring.

"Neither the defendant's "VA" tomato juice label nor its "VA" lima bean label bears such a resemblance to the plaintiff's "V-8" label as would cause the ordinary shopper who might see them on the store shelf to mistake one for the other or to be in any way confused."

9—Patents for Food Substances

Recently, a higher court refused to award a patent on a butter substitute. The case dealt with an application (178 Fed. 2d 945) for a patent on a product made up of 2 parts water-soluble gum and approximately 50 parts of starch mixed with cream—the whole containing approximately 150 parts by weight of butter fat. This mixture was heated, then an edible acid bactericide and approximately 100 parts of uncooked egg yolk were added to make up the "spread."

The court refused to grant a patent, saying that while the product is of a spreadable or semi-solid consistency, the ingredients used are common products and there is nothing patentable.

It then explained that a patent may, however, be obtained on a composition formed by the intermixture of two or more ingredients which results in a product possessing new characteristics materially different from the sum of the properties of the original ingredients.

10—False Facts and a Mortgage

According to a late high-court decision, a chattel mortgage is void if the affidavit attached does not contain true facts of the transaction.

The court illustration (73 Atl. 2d 281) concerned testimony that an affidavit stated an amount advanced to be $9,000. In fact, it was $8,100—the other $900 being actually a bonus for granting the loan.

In litigation, the court held the mortgage invalid, saying that where an affidavit is false the chattel mortgage is invalid and void.

11—Further Protection in Interstate Shipments

Higher courts formerly held that sellers are not guilty of "misbranding" when the advertising matter or labels are shipped separately from the product. But the Supreme Court has now changed this ruling.

In the recent case (69 S. Ct. 106), a shipper was charged by the Government with "delivering for introduction into interstate commerce" misbranded products. However, the shipper argued that he was not guilty because he did not mail or ship the circulars or advertising matter *with* the products.

But the Supreme Court held him liable, stating: "The false and misleading literature was designed for use in the distribution and sale of the product, and it was so used. The fact that it went in a different mail was wholly irrelevant."

12—Determining Liability In an Auto Accident

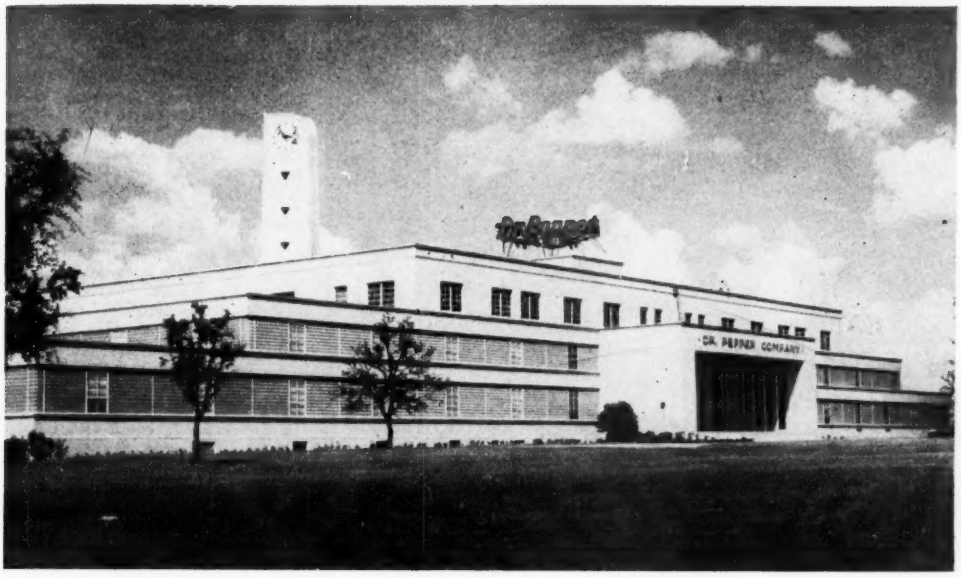
Under what circumstances is an employee entitled to damages for injuries received in an automobile accident? Answer: Only when court testimony shows that the employer paid for and/or furnished the transportation for the injured employee.

In one recent case (94 N. E. 2d 86) it was testified that the manager of a food company directed an employee to take an automobile to a garage to be serviced, and that another employee, a Miss S., was a passenger in the car when it subsequently crashed, seriously injuring her. She sued the company for damages.

The court ruled the company not liable. Testimony showed that for about two years Miss S. had been going to and from her work as a passenger in a privately owned automobile. She never directed the owner how to drive or where to go, and at no time paid for gasoline or oil. In other words, she was an *accommodation* passenger.

The court explained that Miss S. would have been entitled to a judgment damage for her injuries if the testimony had shown that the food company paid the automobile owner to transport her.

These roundups of the latest food-industry court decisions —short and to the point—are special time-to-time interpretive features in FOOD ENGINEERING. *Watch future numbers of FE for the next one.*



GREATEST TRIBUTE to company development is the new Dallas headquarters building, considered to be an outstanding exemplification of modern, functional industrial architecture.

Reverent regard for quality, benevolent ethics, and effective business practices are major factors in . . .

BIG BEVERAGE SUCCESS

FE STAFF

Employing advanced facilities in an operation marked by ballooning sales and enviable annual reports, Dr. Pepper Co. of Dallas has many solid planks in its success platform.

■ **But one factor particularly orients company philosophy—quality of the product.**

"The beverage's distinctive flavor and maintained quality are the alpha and omega of our success," declares J. B. O'Hara, board chairman and soft drink pioneer. "And any forward-looking tactics that we might employ in merchandising, in manufacture, or in company policy are subject to the restraint of this prime factor of quality."

Company history reveals the soundness of this viewpoint. For Dr. Pepper has progressed from a mere over-the-counter item in a single Texas drug store in 1885—to a national-market drink boasting close to a million retail outlets served by 425 franchise bottling plants. All this without any basic alteration in the formula since the origination of the beverage by a creative pharmacist in Waco over 66 years ago.

"Bursting" Out of Texas

A 19-year-old assistant druggist first sold his employer's new drink, called "Dr. Pepper phosphates" by initial customers. He was the late R. S. Lazenby, who improved and perfected the basic flavor formula still used.

Local popularity of the drink became so great that Lazenby decided to offer it in bottles. And in 1891 he formed the Artesian Mfg. & Bottling Co. in Waco—later simply known as the Dr. Pepper Co.

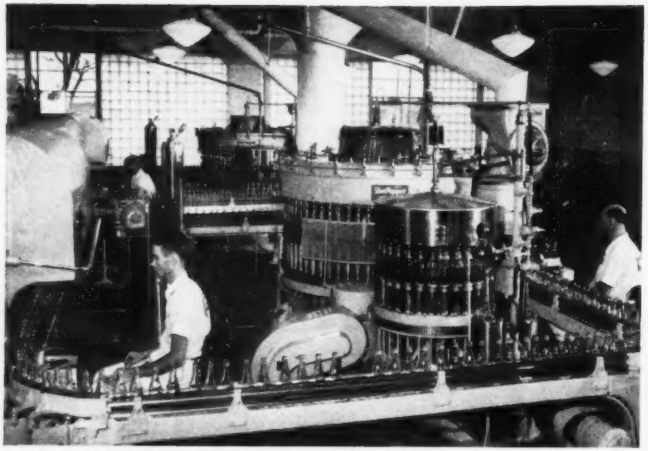
Company growth during the first quarter of the new century was a "chain-reaction" affair. It was not pushed by dynamic merchandising, instead was almost exclusively due to a spreading consumer interest generated by word of mouth and modest local advertising. In 1922 progress in the Central Texas market led to establishment of a main syrup and bottling plant in Dallas, which then served the original Waco area.

Growth, Engineering, and Control

What's behind the outstanding growth of the Dr. Pepper organization, one of the leaders in the carbonated beverage field, is revealed in this first feature of a special three-article series.

An advanced-engineering closeup of the company's syrup manufacturing operation will be offered in a following issue of "Food Engineering."

And details of how Dr. Pepper carries out quality control in the field will be presented in the final article.



MODEL BOTTLING PLANT and proving ground for advanced equipment and materials has two 60-spout fillers. Floor is of rubber and asphalt tile.

In 1925, J. B. O'Hara came into the organization as general manager and started an expansion program that is still in motion. Employing pioneer merchandising technics, O'Hara steered the company to complete coverage of Texas by 1928—with over 600 percent increase in syrup sales—and on to a 38-state spread plus Mexico and Hawaii, at the start of World War II.

In 1930, the company moved to new and greatly enlarged quarters in Dallas and opened a branch syrup-making plant in Birmingham, Ala. And in 1948, a magnificent new headquarters structure, offering nine acres of floor space was completed in Dallas. One of the largest and best equipped syrup plants in the industry, this newest facility offers thoughtfully planned, expandable-capacity for the future.

Calories Count

Basic concept pioneered by Mr. O'Hara is that a carbonated beverage is a food and not simply a thirst-quencher. He points out that a bottle of Dr. Pepper has 100 calories—as much food value as many between-meal snacks.

From this reasoning came the slogan, "drink a bite-to-eat at 10, 2 and 4 o'clock," which has been a cornerstone for all Dr. Pepper advertising. As time went on, the "three a day" theme, and the 3-handed clock symbol that stemmed from it, became constant reminders of the nutritional as well as the refreshing value of the beverage.

Availability Is Keynote

A forthright attitude about the future lies behind much of the planning at Dr. Pepper.

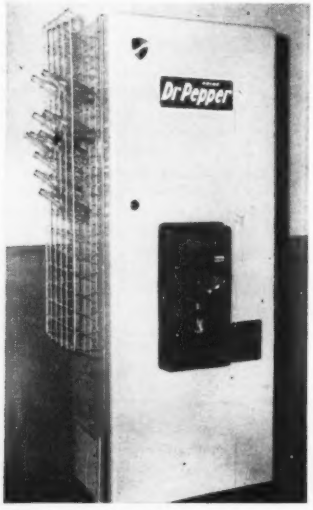
J. B. O'Hara contends that, even today, the rate of soft drink consumption is less than 20 percent of its potential. "When you can reach out, at any casual moment, and enjoy a soft drink as conveniently as a stick of chewing gum," he says, "then our industry will be doing a job."

Reflecting this emphasis on availability is the company's present major drive in locating exclusive vending machines. Any place where people congregate (theaters, stations, department stores, schools) is a possible site. But the primary target—the one least developed, yet with most potential—is industry. This covers one-third of the nation's people. In short, those who are at work when 10, 2 and 4 come up on the clock, and who represent to Dr. Pepper a daily demand for between-meal "pick-ups".

Three types of upright vending units

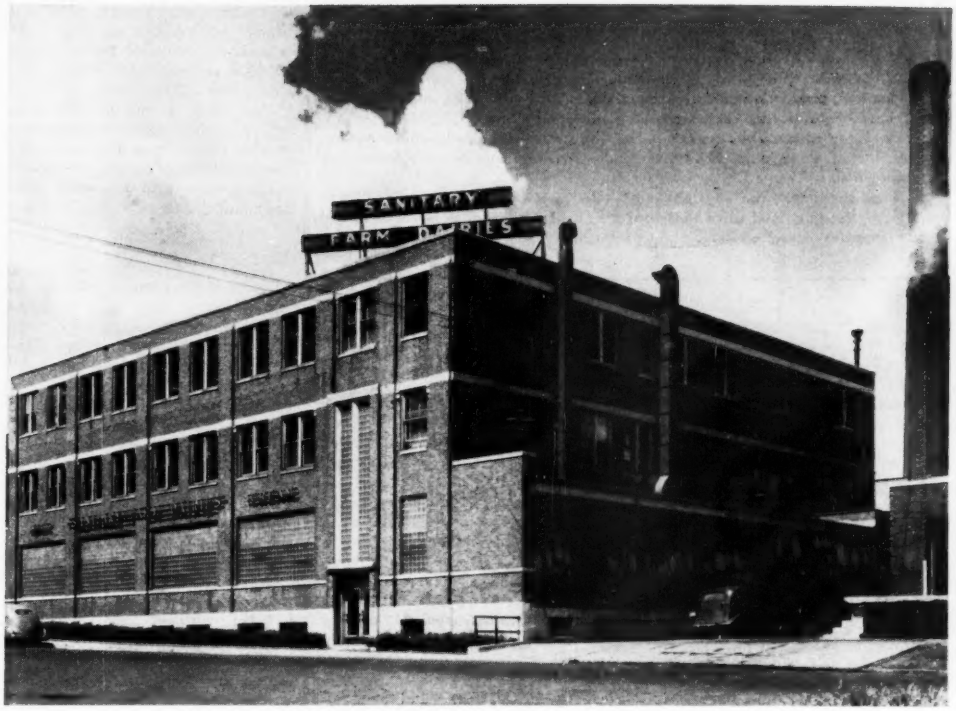
(*Turn to page* 154)

Refrigerated Bottle Dispensers Play Important Role



EXCLUSIVE Dr. Pepper vendors are installed in theaters, stations, stores, schools and factories.

VENDOR MAINTENANCE SCHOOL is conducted at home office in Dallas for benefit of franchised bottler personnel and Dr. Pepper employees. It is one of the several training facilities at the new headquarters.



Rewarding Performance Here at Sanitary Farm Dairies Demonstrates How—

Engineering-Management Team Boosts Food-Plant Efficiency

Practical approach shapes advanced engineering to foresighted front-office perspectives — thus more milk is processed per energy-dollar expended

FE STAFF

Up in St. Paul, Minn., there is a fine example of dairy efficiency—a plant that derives both classical and practical benefits by teaming management perspective with engineering thought.

Briefly, Sanitary Farm Dairies was created and built-up, and is precisely run today, by engineering-minded management. And the efficiency ratio type of thinking is reflected through all phases of the smooth-running operation—from plant layout to route distribution.

Here are a few of the factors by which SFD men swell this ratio—

■ **Efficient use of steam**

. . . They run compressors on high pressure steam, then use exhaust for product heating.

■ **Efficient use of water**

. . . They use cold well water for reefer condensers, then circulate it through plant for processing.

■ **Efficient use of piping**

. . . They locate process equipment in logical, straight-line runs, with supply piping underneath floor.

■ **Efficient use of refrigeration**

. . . They capitalize on compressor capacity by operating commercial cold storage and freezer space.

The above are soundly engineered tangibles that contribute to efficiency. Now let's look at the intangibles—sponsored by an alert management to give efficiency a double-barreled meaning in this organization:

High tribute to the company's outstanding philosophy is its record as being a forerunner: (1) In use of short-time pasteurization and homogenization in Minnesota; (2) in introducing vitamin A supplemented milk in the state; (3) in offering the square glass bottle in the US, and (4) in

There *Are* "Two Ways About It"

Efficiency, say the lexicographers, is the power of continuous, competent action. And most enterprising plant managements echo this definition—their aim being high production performance minus balks, bottlenecks, and deadwood.

To engineers, however, efficiency has a more precise, more tangible meaning. To them it's a measurable quantity—the ratio of effect produced to energy expended. And their job is to improve that efficiency ratio in unit operations wherever possible.

In short, there *are* "two ways about it"—the management approach and the engineering technic. And when these two are astutely teamed, as in the Sanitary Farms operation described here, plant performance gets stimulation-plus.

—The Editors

employing low pressure steam in short-time pasteurization.

Behind all these innovations is Vice-President Walter Riedel and the five brothers, who operate the company's several plants in St. Paul, Cedar Rapids and Clinton, Iowa, and Houston and Bryan, Tex. Walter, who also doubles as roving engineer, headquarters in the St. Paul plant—the first of the chain to be established. Accordingly, most of the advanced engineering ideas are proved out here before being effected throughout the organization.

Streamlined Layout

Before further exploring the various tangible and intangible efficiencies, a spotcheck of the facilities of the modern 3-story brick plant in St. Paul is in order.

Milk is received in a special tile-enclosed room lying between the receiving platform and processing area. Here, stainless steel cans are dumped and washed, and milk is weighed, plate cooled, and piped through the wall to storage tanks.

From the tanks, which are located along the receiving room wall, milk follows a short path to a 22,000-lb.-per-hour York short-time pasteurizer that is piped in series with two homogenizers. Bottling follows in two glass lines—a Cemac filler that handles 120 qt. and a Milwaukee unit filling 100 qt. per min. In addition, Ex-Cell-O machines are available for quart (39 per min.) and 2-qt. cartons (25 per min.).

Also included in the white-tile and glass-brick enclosed processing room are vats for preparing cream, buttermilk, and a chocolate milk. These can be quickly connected into the product-flow scheme by a simplified, short-distance hookup.

A well planned endless moving system speeds bottles in and out of the plant. Bottling operations, in the corner of the room, are looped by a chain and rail-guide conveyor. This brings in washed empty bottles through an opening in the tile wall and carries out filled crates in the other direction.

After its brief loop through the processing area, the conveyor makes a complete circle of the cold storage plant, emerges for a spell on the shipping and receiving platform, then runs the length of the bottle washing room.

Besides bottling facilities, the plant includes seven cold storage rooms that are held at zero, and one quick-freeze area utilizing an air blast of −40 deg. F. Together, these add up to 130,000 cu. ft. of low temperature space.

When the milk supply is flush, the plant can process about 150,000 lb. daily. This is distributed within a 30 mile radius of the city by over 100 company trucks—operating over 100 retail and 22 wholesale routes. A company garage, just behind the plant, houses and maintains the vehicles.

"Below-Deck" Revelations

Ingeniously simple layout and white-tile sparkle in the processing area give little hint of the many engineering improvements. To get the complete picture, we must go below decks to the engineers' realm.

The first thing one notices in the spanking clean engine room is a maze of colored piping along its ceiling. For all lines are color-coded and routed in rectilinear paths to each processing unit. For example, high pressure steam travels in orange colored pipe, low pressure steam in yellow, and cold water in appropriate green. Electric lines are white, and sewer lines are aluminum.

Let's track down the use of high pressure steam via its tell-tale orange path. It starts in a well-located boiler room, where two 175-hp. oil-fired boilers deliver steam at 125 lb. pressure. The main orange pipes terminate in two 90-hp. Corliss engines. One of these drives a Wolf-Lind 90-ton horizontal refrigeration compressor. The other furnishes power for a 70-ton Vilter unit.

Two electrically driven compressors —a 9x9 Vilter and 9x9 York—stand in the background. These are used to furnish refrigeration at night when steam is not required for processing.

Yellow colored lines radiate from the engines. These reveal that 9 lb. exhaust steam is run into the plant for processing and winter heating. Smaller yellow lines form a parallel network. These comprise a condensate return system, with a vacuum pump forcing all salvageable Btu.'s back to the boilers.

Extra Large Piping

Use of low pressure steam is a material economy, for, in a sense, the plant receives its refrigeration at no cost during processing hours. Also, low-pressure steam is easier to handle and control.

Biggest virtue here has been the remarkable stability at the short-time pasteurizer, with flow-diversion due to under-processing practically eliminated.

Since the heating capacity of low-pressure steam is much less than normal process-equipment requirements, all lines to equipment had to be sized accordingly. For example, a special oversize hot water supply system was designed by Riedel for the York pasteurizer. Here, a 2½-in. steam line replaces what normally would be a 1-in. pipe. The diaphragm control valves also had to be oversized to pass sufficient steam to the process.

A small orange colored pipe branching off across the engine room ceiling gave evidence that the only point in the plant using high pressure steam is the final section of the can washer.

Sanitary Farm's dual use of steam and balancing of process needs against plant refrigeration suggest that normal dairy processing and extra-capacity cold storage make a natural commercial combination. This pairing is a good case of "the ends justifying the means", for the extra compressor capacity and storage space is readily vindicated by the need for sufficient low pressure steam for processing.

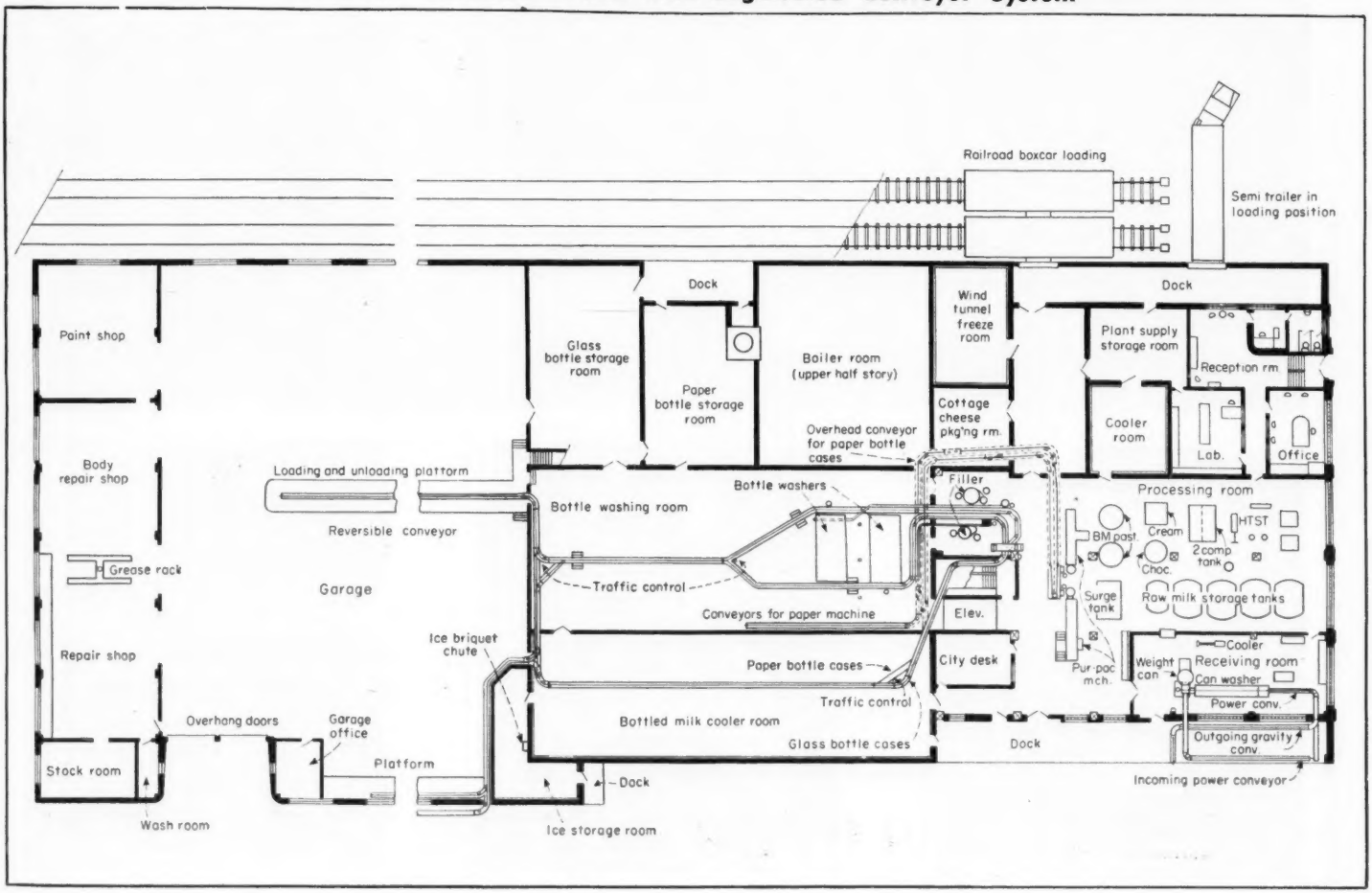
Double Use of Water

Preponderance of green in the multi-color piping complex bears out the fact that a good deal of water is used in a dairy plant. Two main headers bring water from company wells, supplying 600 gal. per minute.

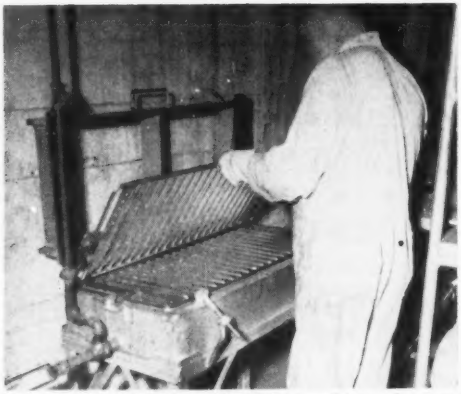
By following the green pipes it is indicated that water, like steam, is also used twice in this efficient plant. First, the bulk of it is piped over to a series of refrigerant condenser tubes. Here, the cold (49 deg. F.) well water is raised to 58 deg. F. It is then pumped through the plant for all processing,

Plan and Photos Follow →
Text Continues on p. 107

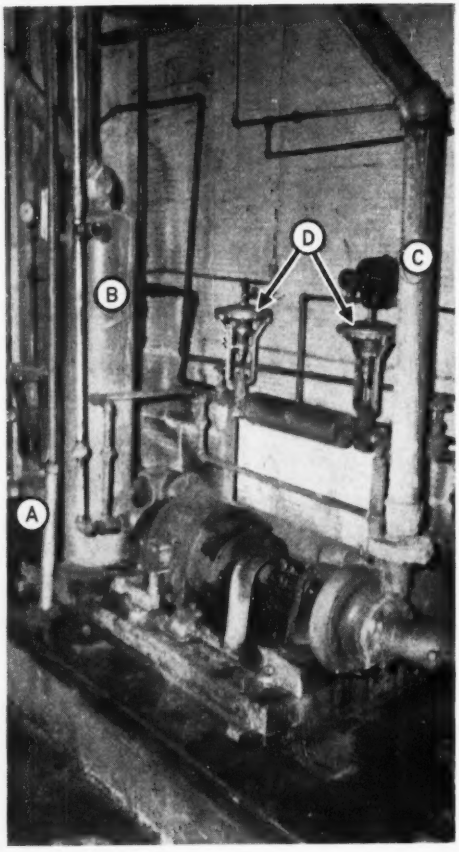
PLANT LAYOUT – Note Well-Engineered Conveyor System



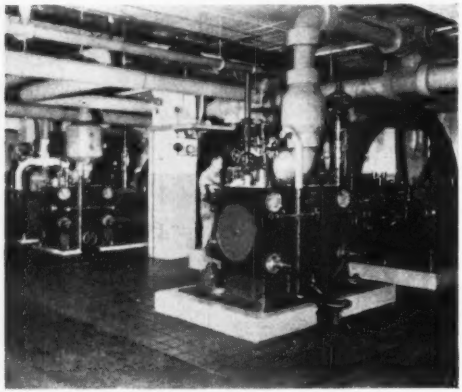
Efficiency Check Was Given Each Piece of Equipment



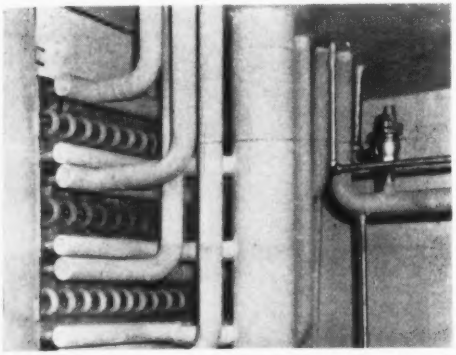
PLANT-DESIGNED VULCANIZER is used to replace gaskets on pasteurizer plates. Unit has eliminated 90 percent of gasket trouble, requires no supervision.



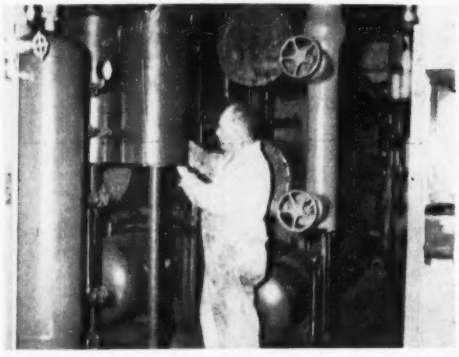
PROCESSING with low-pressure steam necessitated construction of oversize water heating system. (A) is 3-in. steam line, (B) hot water tank, (C) 4-in. pasteurizer feed line, and (D) stand-by high-pressure steam system.



HIGH PRESSURE STEAM drives these Corliss engines which, in turn, run ammonia compressors. Exhaust steam is used for processing operations.



COIL at ceiling requires ammonia accumulator in penthouse above. Oversize leg (center) was provided to meet future needs.



CONDENSERS were oversized to keep down head pressure on ammonia compressors. Year-'round 49 deg. F. well water makes low pressure possible.

and other uses such as truck washing.

Oversize condensers, together with the cold water, insure a low head pressure on the ammonia compressors—about 110 lb. rather than the usual 180-200 lb. Use of this technic greatly increases reefer capacity and is much easier on machinery.

Three colors delineate the flow of refrigerant through piping. Liquid ammonia branches out from the compressors via black pipes to evaporators throughout the plant. Returning suction lines are colored gray. And hot gas is handled in red piping.

In addition to supplying refrigeration for cold storage and processing areas, the compressors are also responsible for production of 30 tons of ice daily. This is made in Vilter Pack-Ice and briquette machines. Ice is then bagged in 25 lb. sacks and portioned out to drivers for milk chilling during morning deliveries.

Blast Freezer Installation

Considerable thought went into the layout of the plant's quick-freezing room. Originally designed to freeze homogenized whole milk under Government contract, the room has recently taken on the additional job of fast-freezing pork and turkeys, as well as butter, cream, and other products.

The entire air blast system—coil, fan, and accumulator—is located at or above, ceiling level. This allows maximum use of the room floor area. Further, the assembly is concentrated in one-half the ceiling's width. Future location of a companion air blast system could thus double the room's freezing capacity.

An insulated penthouse atop the freezer room houses the horizontal ammonia suction accumulator. This location was necessary in order to obtain the proper static head on the coil at ceiling level. The accumulator and its vertical liquid leg were oversized to adequately handle a doubled load in the future.

Accordingly, when the dairy decides to up its current 30,000 lb. (frozen milk) capacity to 60,000 lb., the installation, in the available space, of a fan and coil with connections to the accumulator will be a relatively simple job.

Other Efficiencies

Many other simple, yet major, trouble-saving innovations dot the plant and add to its healthy efficiency ratio. These, according to Manager-Engineer Riedel, reflect this constant scheme of progress:

1. Improving on the mechanics of an operation
2. Simplifying an operation
3. Investing in time-saving equipment

Here's an example of how the dairy has improved the troublesome operation of replacing plate pasteurizer gaskets—involving one of the most time-absorbing headaches of dairy maintenance. Normally, these gaskets have to be glued on, then clamped in the pasteurizer press to undergo at least 2 hr. of hot water circulation.

Today, a novel vulcanizing machine, developed by Riedel, easily performs this chore without taking the pasteurizer out of service. The trouble-causing plate is placed, with a new gasket, in this unit and subjected to a 2-to-3-hr. steaming at 225 deg. F.

Not only does the vulcanizer require no attention during the operation, but the better job that it does has eliminated 90 percent of the plant's gasket difficulties.

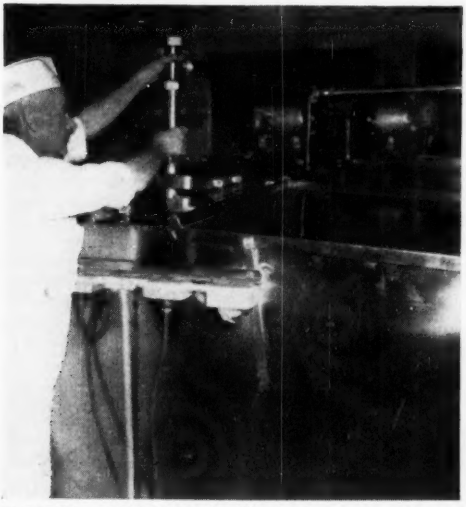
And then there is the ever-present challenge of simplifying an operation. A homely instance is the tedious manual routine and brother with parts necessary to effect a change of milk flow from one vat to another. Faced is maintenance and hard adjustment of at least one 3-way sanitary valve, if not the necessity of wrench-and-hexnut hook-ups of pipe to tank.

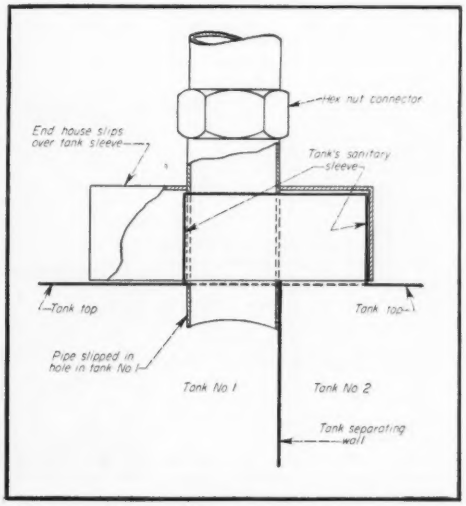
Unit Makes It Easy

A modest plant-built sanitary fitting has greatly simplified this operation. It is an enlarged pipe ending which allows shifting of the pipe feed from one side to the other of a two-compartment vat. In making a switch, the attendant merely lifts the pipe and slips its cupping device over the required vat opening.

Employment of time-saving equipment is probably the most dramatic way to increase efficiency in a plant. For the man-hours saved can be reckoned in solid dollars and cents.

One unit of this type is the time-saver that daily "whirls" around the company garage—a 5-hp. gas-powered vacuum sweeper, made by Wilshire Power Sweeper Co. In this case, an investment of less than $1,000 has resulted in a daily saving of 2 man-hours in clean-up time. And the job done by the mechanical unit surpasses the best manual housekeeping.





FLOATING SANITARY FITTING is simple plant-designed device for rapid, easy shifting of milk flow from one tank compartment to another. Left: Operator making the quick change. Right: Cutaway of the unit.

Laboratory keys . . .

In this plant-tour article, you see how the laboratory "hubs" the exacting manufacture of the highest-grade flavors . . . Big-plant efficiencies are applied to make the small, precise lots on which processors rely

CONTROL POINT of the many manufacturing activities, laboratory is divided into development, research, compounding, and quality checking sections. Its major work is serving as process watchdog.

Flavors With *Non-Stray* Quality

F&J Engineers Them by *Perfection-Caution* Technic

FE STAFF

Makers of flavors are perfectionists. Their delicate creations cannot be permitted to stray from established excellence. For there is no more basic, yet subtle, key to consumer acceptance of a food than its flavor appeal. And the product's sale will only be as good as its flavor.

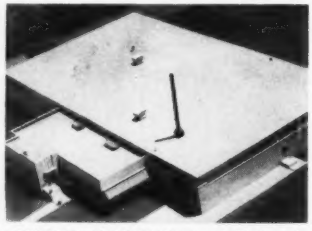
Thus, with steadfast quality vital, users of fine flavors have come to rely on their suppliers with a confidence that has little parallel in other industries.

How does a flavor maker go about warranting this confidence? A tour of the Foote & Jenks operation in Jackson, Mich., is a good way to find out. For this "old line" house notably exemplifies its industry's high standards.

- **Here, production and sales are oriented by strict, top-authority laboratory control.**
- **Extreme cleanliness is emphasized in a spacious, well-lighted operating area.**
- **Greatest care is taken in the deionizing and purifying of all plant process water.**
- **Specially designed process equipment is employed to meet the unique demands of the company's manufacturing technics.**

On approaching Foote & Jenks to begin your tour, the plant's unusual window-strip running around the entire building makes the first striking impression. This evidence of lightness and airiness serves to introduce the "perfectionism" accented in the flavor field. The steel-sash windows circle the one-story building just below the ceiling level. The structure itself contains 27,000 sq. ft. of floor space and is constructed of steel, concrete, and brick.

Because flavor making has defied large-plant production technics, plenty of thought had to go into the layout of this modern structure, which was erected in 1946. Organized around a laboratory focal point, the processing facilities accentuate small-lot, multi-product operations under rigid lab control. Yet floor space is apportioned to allow for volume packaging, materials handling, and storage.



MODERN BUILDING is girdled with continuous windows, provides spacious, airy quarters for processing.

Result is that Foote & Jenks has achieved remarkably high efficiency in what amounts, necessarily, to a laboratory-type operation.

Caution Is the Keynote

In your first stop in the plant, you chat with Paul Thurston, sales manager for the 67-year-old firm.

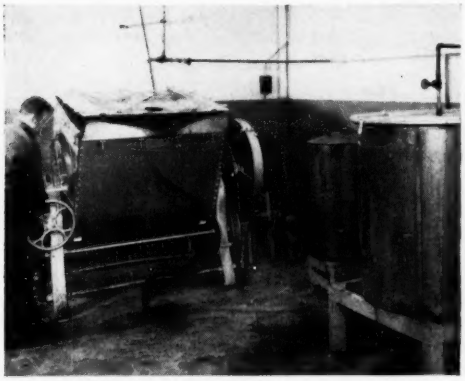
"What one thing," you ask, "has been outstanding in establishing confidence among users of your flavors?"

It's a tough one for Thurston to answer, because he knows that a great many factors play a part in inspiring confidence—high standards in product and package, company readiness to consult, prompt deliveries, and numerous others. But if one underlying principle, one philosophy characterizing the company's success and soundness, is to be picked, then *caution* gets the credit.

"Caution," says Thurston, "is the keynote of successful flavor manufacture. No carelessness can be tolerated, from initial selection of raw material to final release of a finished batch. Sloppy thinking or acting anywhere along the line can throw a flavor 'off'."

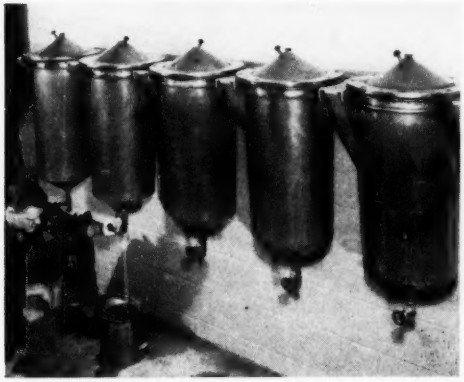
Primary exponents of caution are the company employees themselves. And

. . . all unit operations in flavor making

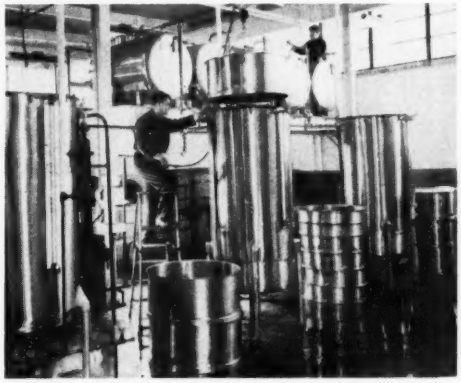


MACERATION AND DECANTING to extract flavor involves long soaking in solvent with gentle agitation. Operator is seen decanting stratified liquor.

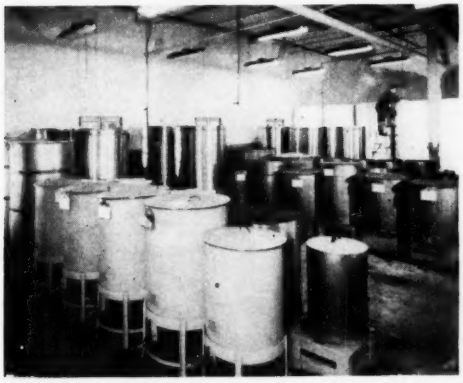
COMPOUNDING AND EMULSIFICATION are handled by skilled technicians. Man at right adjusts homogenizer to produce desired particle size in emulsion.



PRECISION PERCOLATION in small lots is the practice with rare plant materials such as grains of paradise. Solvent volume is rigidly prescribed.



VOLUME PERCOLATION of pure vanilla is performed in three percolators without heat or vacuum. Tanks above hold alcohol menstruum which is gravity fed.



AGEING of different flavors is carried out in variety of tanks. Proper tank lining is a "must." And careful timing and frequent evaluations are requisite.

FILLING into brown-glass, large-mouth consumer jars is final operation prior to shipping. No product is released unless passed by lab.

interest in their work runs high because over 90 percent of them own company stock. This personal identification with the product, plus the fact that the employees average over twelve years of company service, spells unusual care in the plant.

Another aspect enforcing caution is the type and layout of equipment used. Processing units were built to company design with better-than-average sanitation in mind. Further, light and space in the processing areas facilitate easy clean-up. These factors contribute in keeping finished products free from coli, yeasts and molds—sure disturbers of dependable flavor characters.

But the high priest of caution in this plant is the chief chemist. Not only does he carefully guide each flavor batch through its unique steps of quality processing, but he is also the final arbiter as to whether the batches meet the standards for release to the buyers. His position is that of a "benevolent tyrant." His decisions may, at times, tend to irk—but they work to maintain the requisite standards on which so much depends.

Lab Is Crux

It is the laboratory, then, that is the actual focal point of the manufacturing activities. Here you meet Chief Chemist J. C. Abbey, whose realm extends far beyond the doors of his large, well-equipped research and quality control laboratory.

Mr. Abbey tells you how his laboratory serves many purposes. First of all, new flavors are developed here to meet customers' special requirements. Also, pure research in the chemistry of flavors is always in progress. And the findings, in the form of fundamental knowledge, are constantly contributing to company processes and formulation. The laboratory also serves as compounding department, where blends of flavors are precisely made up.

However, it is the routine bustle of quality control during manufacture that occupies the major time of the laboratory. Each batch being run for commercial sale is tested here, during the various phases of processing, on the score of character, strength, stability, and freedom from bacteria. If the batch passes muster, it officially receives a batch number. A control sample bearing the same number is then shelved and periodically referred to until the batch is ready for release.

Large Scale Technics

Flavor manufacture has had little publicity, hence you won't find Mr. Abbey surprised if you lack knowledge of what goes on beyond the doors of the research and quality control laboratory—that is, "out in the plant."

However, before you tour the actual processing area you are set straight. You are not really going "out into the plant", but simply into another laboratory. For flavors are made in "laboratories" rather than factories.

You soon see why. Many pieces of stainless steel equipment are grouped in various locations on the floor of the processing area. While massive, each set of equipment primarily simulates a unit operation that might be carried out with equal caution on the bench of a well equipped laboratory.

Your eye picks out the operations—percolation, maceration, extraction, mixing, emulsifying.

Most impressive grouping of equipment is that for volume percolation of vanilla. Three sizable stainless steel tanks—company designed for heatless, atmospheric pressure percolation—are used to extract several hundred gallons of pure vanilla daily. Poised above these are a series of five alcohol menstruum tanks that gravity-feed to the percolators.

Many Varieties

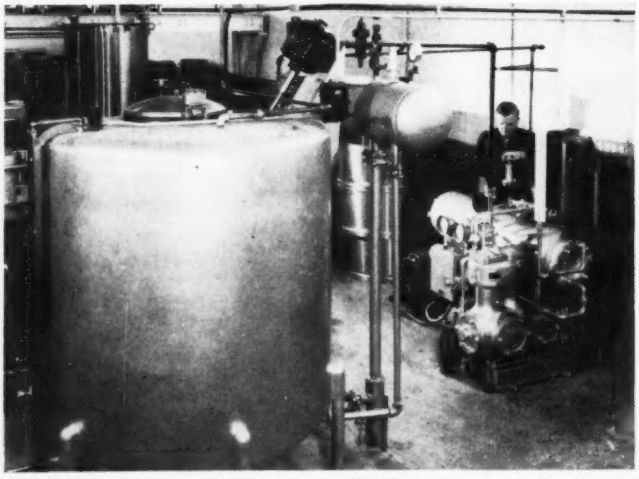
Vanilla processing may be termed the No. 1 Foote & Jenks activity—with 24 different pure vanillas and a dozen compounds included in its well-known line. To assure quality, beans are purchased whole and a large inventory kept in the plant. This allows close scrutiny of each bean bundle before use and eliminates quality-reducing cull beans.

First step in the extraction of a batch of vanilla is selection of the proper bean type. And this is followed by chopping in a Fitzpatrick comminuter. Finely divided beans are then transferred to stainless steel baskets, which are hoisted into the percolators. Gravity extraction with alcohol menstruum follows, and the vanilla is then piped to ageing tanks.

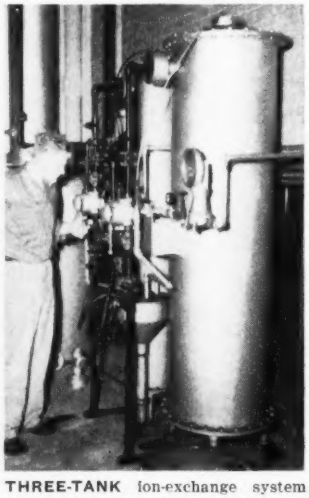
Ageing is one of the most critical phases in the manufacture of vanilla and other flavors. Instead of the calendar, it is experience—in sampling and calculations—that determines when a batch is ready for shipment. Further, the type of tank and its lining material—wood, Monel, stainless steel, or glass—plays an important part in flavor esterification. Eight or nine months are often required to bring out the desired mellowness and fullness in a particular product.

In the corner of the processing area,

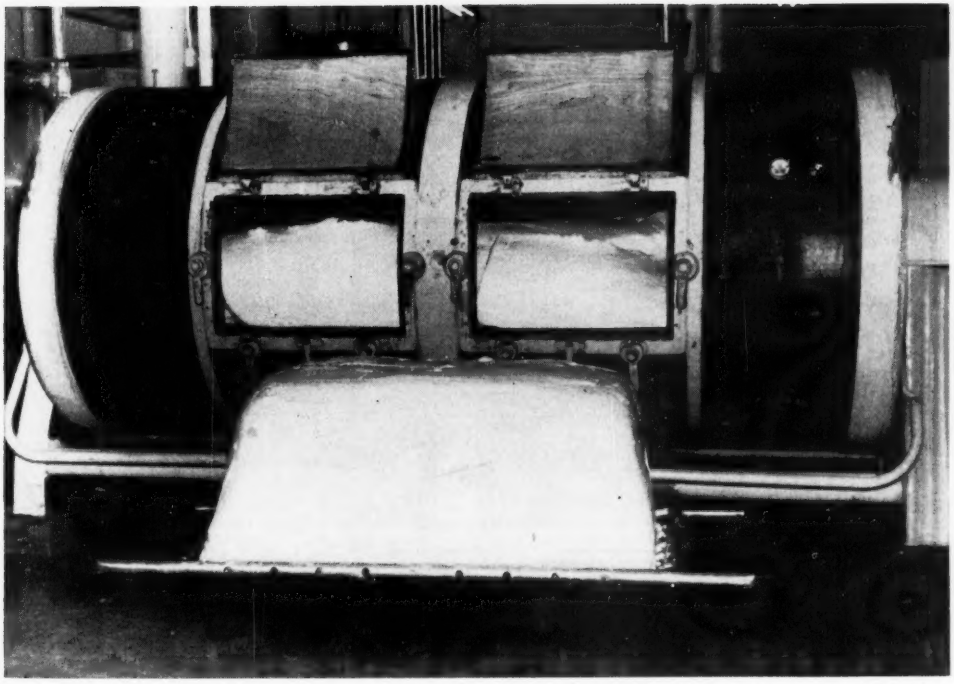
(*Turn to page* 209)



REFRIGERATION is applied here to glass-lined vat to prevent temperature rises during removal of terpenes from the essential oils.



THREE-TANK ion-exchange system provides proper process water.



. . . **LOOKS AND FEELS** like butter—and has similar moisture and curd content. Seen is churn and loaded pallet.

New Churned Margarine Is *Texture Triumph*

Revolutionary process turns out product with body characteristics like those of butter. Method: Reversible oil-milk emulsion is formed, then broken by churning

LLOYD E. SLATER
Assistant Editor, "Food Engineering"

Newest development at Armour and Company is an improved margarine that reportedly resolves "the last perceptible differences between this popular food's body and texture and those of butter."

This spread, say its makers, may well write one of the final chapters in the success story of the widely distributed product.

Inventor of the new margarine and its process* is V. L. Turgasen, production manager of Armour's butter and margarine division. He started with the dramatically simple idea that *in order to obtain a texture like butter, the margarine must be constructed like butter with respect to the fat-water emulsion.*

Several years of research and development devoted to elaborating on this theme have resulted in commercial production of the new product, labeled "Cloverbloom 99." Following are highlights of the process:

- **It uses the same fats and/or oils as in conventional margarine making.**
- **It disperses these fat globules in a milk medium to simulate cream.**
- **It subjects the cooled emulsion to a churning identical to that in butter making.**

To better evaluate the reasoning behind Turgasen's development it might be helpful to briefly review past progress in margarine.

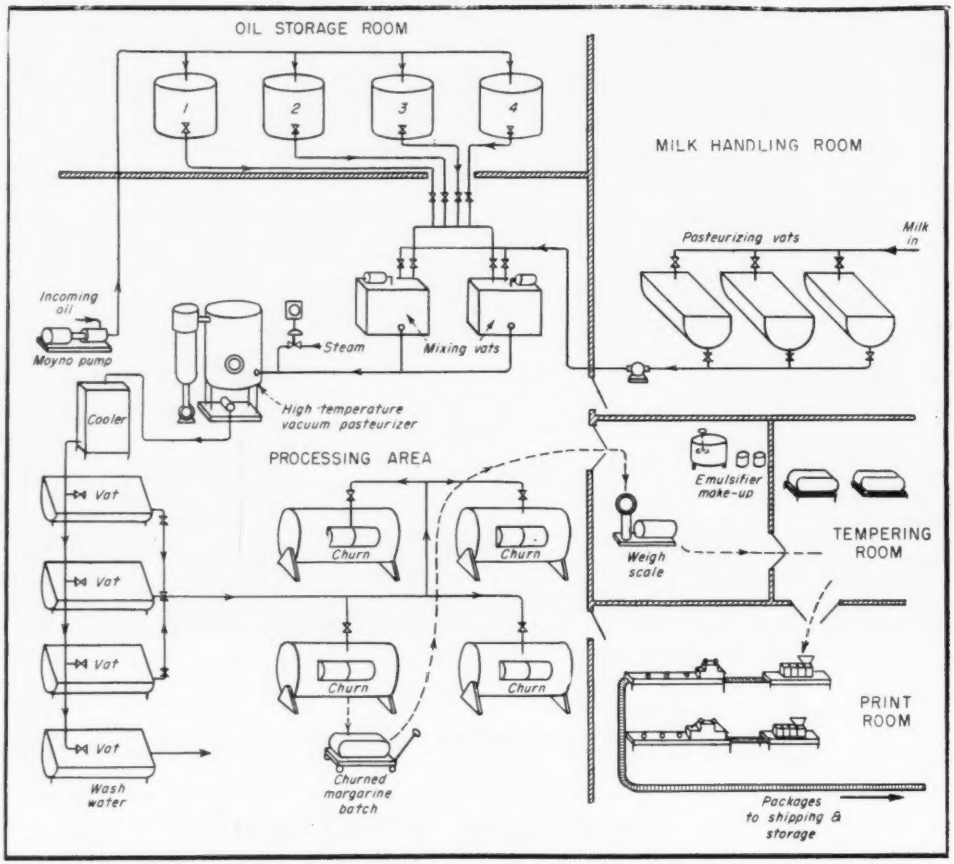
Oils and Milk Blended

While the fats and oils used are quite different in flavor from milk fat, sensational gains in processing these ingredients have greatly upgraded quality and purity. Further, equally substantial progress has been made in the subsequent technics of mixing or blending oils with cows' milk, or milk culture made with specific flavor-producing organisms.

These technical advances have whittled the disparity to such a degree

*U. S. Patent No. 2,526,320, Oct. 17, 1950.

How improved spread is made . . .



that now the flavor of some margarine is comparable to that of some butter.

Among consumers, the most notable and fundamental differences claimed concerned body and texture. Margarine, when taken in the mouth, produced a sensation of greasiness and gumminess—one reason being its fine dispersion of moisture. It did not have the smooth waxy feel, accompanied by a quick breakdown in the mouth, which is characteristic of butter and is a rather strong consumer-preference factor.

Butter Construction a Model

In sponsoring the researches that led to Cloverbloom 99, Armour was convinced that, if a margarine could be produced with body and texture identical to butter, much of the prejudice against the product would disappear and its consumption would materially increase.

Most dairy technologists agree that butter is a solid system of water-in-fat emulsion with a continuous phase of semi-solid, free butterfat. In this system are dispersed fat globules, moisture droplets, and air bubbles—each being stabilized by an envelope of protein material.

Theory of Churning

Extensive study of milk fat globule structure suggests that each is coated with a so-called protective film. The inner portion of this film has been found to consist of a more-or-less continuous layer of phospholipid-protein material. On the outer, or water, side of the layer there is absorbed a concentration of skim milk constituents—principally casein. These outer materials appear to be more loosely held than the inner phospholipids.

It is believed that exposure of portions of fat surfaces, which is due to lack of continuity or actual rupture of the protein film, causes fat globules to adhere and form butter granules during churning.

Turgasen set out to simulate this structure in his new process. In essence, his major researches sought a method of producing a reversible emulsion of oil in milk with an orientation of protein milk-film to fat—that is, an emulsion similar to that of the cream used in butter making.

Conventional Oils Used

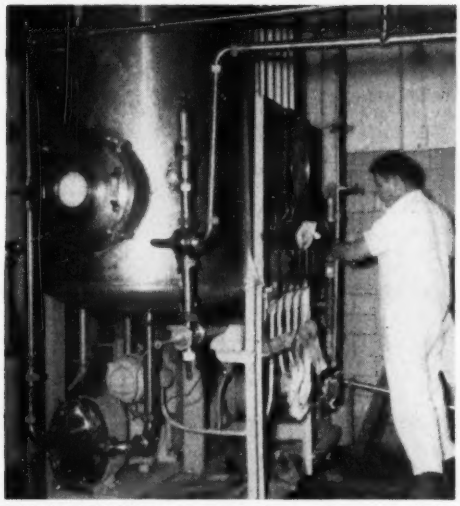
In the process that evolved, the same fats and oils normally employed in conventional margarine processes were found suitable. These are warmed to slightly above their melting points and mixed in an agitated vat with either skim or whole milk. Proportions are approximately 1 part oil to 2 parts milk.

As previously mentioned, either sweet or cultured milk can be used. The latter is indicated if a specific cultured flavor is desired in the finished product.

Vat agitation of the milk-oil blend, to effect an intimate mixture, is the

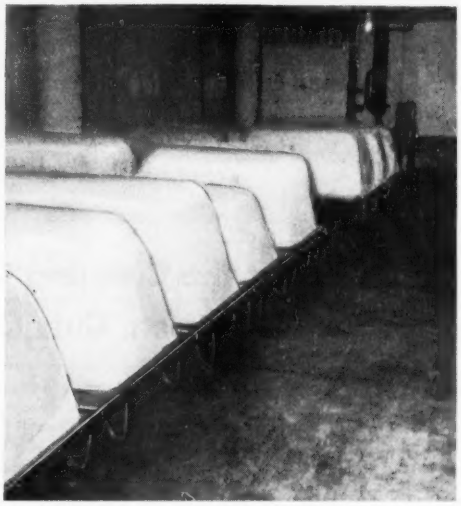
. . . and photo highlights of process

OIL flows into coil vat and is mixed with milk at controlled temperature. Later, mixture forms basis for emulsification.



STEAM-VACUUM treatment is key. Steam is injected in product in pipeline (center) feeding vacuum chamber.

CLUMP GROWTH in churn indicates it's time to remove skim milk. Then plastic mass is formed by re-churning.



MARGARINE is tempered in this air-conditioned, temperature-controlled room. It is thus stabilized for packaging.

step prior to forming a reversible emulsion. Here, Turgasen takes advantage of the fact that milk proteins are able to lower the surface tension of a water medium. This property leads to relationships that are vital from the standpoint of phase distribution and stability of the oil-in-milk system.

Next comes the step in the process that is the key—in that it orients the protein in a film, preventing coalescence of the dispersed fat or oil and providing a fairly stable but reversible emulsion.

To form the emulsion, the milk-oil mixture is pumped (or otherwise introduced) into a tube or vessel and, at the same time, exposed to needle-like jets of live steam under pressure. This steam is injected in the direction of flow. It may be noted that the injection tube or pipe is equipped with a restrictive valve at its end to provide suitable back pressure on the mixture.

Adding live steam raises the temperature of the oil-milk mixture, and the needle-like jets partially disperse the continuous fat phase into an oil and milk emulsion. At the same time, the steam treatment physically alters the milk proteins so that they may orient themselves on the surfaces of the globules.

Vacuum Dispersion

Subsequently, there is release of the hot flowing emulsion into a chamber or vessel under partial vacuum. Since the product enters this chamber through a restrictive aperture (the back-pressure valve), it flashes into a fog-like mist that accomplishes the

final dispersion of small oil globules in the milk. And because of physical change in the non-fat constituents, the surrounding protein membranes are formed at the fat-liquid interfaces, thereby stabilizing the suspended globules and preventing their immediate coalescence.

The product now consists of a fairly stable emulsion—one which has the appearance and taste of cream.

Now, the milk-oil emulsion is pumped from the vacuum chamber over a conventional cream or milk cooler to reduce its temperature below the solidifying point of its fats or oils. At this point the product can be transferred to holding vats, where starter distillate or milk culture is added.

From these vats the emulsion is transferred to conventional butter churns and treated in the same way as cooled cream. Agitation within the churn—which is held at a temperature favorable to aggregation of the fat globules—results in a progressive growth of clumps. When the ratio of clump-surface area to cubical content becomes relatively small, the emulsion suddenly breaks and the fat separates in the form of a plastic mass.

Incorporation of air into the emulsion is a vital factor. This allows fat globules to aggregate in the air/serum interface, thereby bringing the globules into contact and further speeding aggregation. In addition, small moisture droplets are formed during churning and these are protein-stabilized and incorporated into the mass of plastic fat.

Thus, as in butter construction, the product now consists of fat globules, air bubbles, and water droplets surrounded by hydrated protein films.

Tests Like Butter

When the aggregates in the churn approximate the size of small peas, the operation is stopped and skim milk

(*Turn to page* 155)

Tool Crib for the Cleaning Crew Improves Sanitation, Cuts Cost

FE STAFF

Delegation of very definite responsibility to each unit of the clean-up crew, in a system featuring compartmentation of equipment and supplies has had several notable advantages at an East Coast bakery:

1. Costly replacements of washdown and clean-up equipment and supplies are now less frequent.

2. Cleaning operations not only are more thorough, but they are also accomplished much more rapidly.

3. Worker morale, as a whole, has been decidedly improved.

Formerly, plant cleaning comprised a general assignment to a unit of the maintainance department. Clean-up requirements divided the workers into three groups: One crew maintained sanitary conditions in the room where milk and other dairy products are stored and prepared as ingredients. Another group kept the walls, floors, and equipment clean in the area where the dough is prepared. To the third section went the task of maintaining the rest of the plant in proper condition.

Under this system, hose (both steam and water), pails, brushes, mops, and all the tools used in plant clean-up, were shared—first come first served. And regardless of instructions, the most convenient implement was chosen—rather than the one most suitable for the operation.

When the job called for a hose for steam washing, the hose most easily located was, too often, a water hose, and nevertheless was used. At the same time, it was not uncommon to find hose designed for steam-cleaning connected to water lines.

Result was heavy hose mortality.

Similiarly, other equipment was misused, misplaced, or lost, all through carelessness or indifference—but not because of lack of understanding.

Simple Cure

Today, however, this confusion and lack of efficiency has been overcome by the introduction of a simple and inexpensive procedure.

First, three small compartment-type storerooms were constructed of wood frame and covered with strong wire mesh. And each of the rooms had its own padlock and keys. Next, one of the compartments was assigned to each clean-up crew—General, Bowl Wash, and Vat—and the name of that group was painted on the respective compartment doors (see photo).

Then, each storeroom was equipped with all the implements necessary for the specific job of the crew. Furthermore, each crew member was provided with a key and was specifically informed of his own responsibility and his group's responsibility, for the use and condition of its equipment and for the orderly appearance of its storeroom.

Spotcheck of Benefits

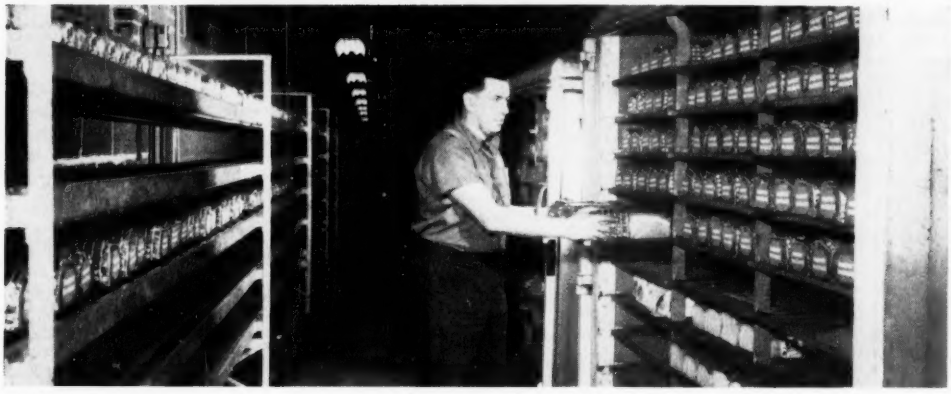
Depreciation of implements is now less, since they are properly used, and steam hose is used only on steam lines—water hose for water.

Borrowing or purloining of equipment has ended—for when not in use, all tools, implements, and supplies are in place in the storeroom, under lock and key.

The new sense of proprietorship thus promoted has stimulated pride in the care of tools, cleaning is more thorough, and equipment-replacement outlays thus avoided represent a considerable saving.

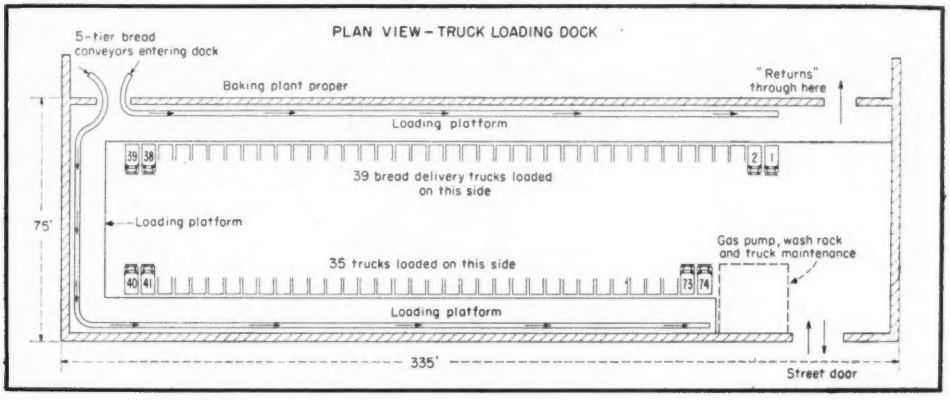
What's more, the improved morale of the clean-up crews is even reflected in the general attitude of the other workers in the plant.

From Tier-Conveyor . . *Loaves Are Whisked* . . Into Trucks



IN EASY pivoting movement, a Schmidt "preloader" transfers freshly-wrapped bread from 5-tier conveyor (left) into special shuffleboard shelves of trucks (right). System makes it very simple to load according to varieties.

Layout of Dock and System of Feeding Conveyors



"Shuffleboard" Truck Shelves For *Fresher, Speedier* Deliveries

Revolutionary bread-truck loading and unloading system saves many hours, augments packaging operations, and makes driver-salesman's work simpler

DELIVERY of fresher packaged breads has been assured through faster truck handling at a large Baltimore bakery. Here, new custom-designed trucks are a key part of the operation that has cut hours from the time between baking and delivery, increased packaging department output 30 percent, and made the driver-salesman's job easier.

From the exterior, the trucks look the same as any standard bread wagons. But unique shelving is the big difference. Regular step-in-drive route trucks, on G.M.C. and Chevrolet chas-

sis, were converted to carry the special shelves. In contrast with standard bread wagons where both loading and unloading is done through a rear door, Schmidt loads from the back, but unloads from the driver's end.

Also, the entire available volume of the truck is actively used for bread storage—no space being taken up by a walkway or aisle. Therefore, the payload of each vehicle has been raised appreciably.

The trucks are filled with shelves from floor to ceiling—each one running the entire length of the body up to the back of the driver's seat. Looking in from the back, it is noted that they are arranged in three vertical groups, ten shelves in each of the outside stacks and eleven in the middle. Each of the bottom shelves in the outside stacks rests on the rear-wheelhousing, while the lowest one of the center group sits directly on the floor.

In loading, a worker opens the rear door and pulls out one of the shelves approximately 12 in. from the stack. He then places the proper number of loaves on the projecting shelf to fill its width. Next, he grabs the sides and shoves the shelf a bit to slide the bread forward. This process is repeated until the unit is full—45 loaves—by more or less shuffling the bread from one end of the shelf to the other.

When the driver makes a delivery, he unloads from the front end of the truck. He selects his order from the twelve different varieties packed by Schmidt, thus leaving empty spaces on the front part of the shelves. These spaces are automatically filled—for the bread tends to slide gently forward each time the truck makes a stop. There is usually no occasion to open the rear door during the delivery period.

Each shelf is 22½ in. wide and 108 in. long. The bottom is made up of wires—spaced 1 in. apart—running lengthwise. The wire construction accomplishes two things: Provides some open area for ventilation and minimizes friction between bread and shelf in the shuffling procedure.

There is a 6 in. space between each tier of shelves. And since the average loaf is 4¾ in. high, the bread cannot jostle out of place while the truck is moving. All in all, 1,395 average-sized loaves can be carried at once.

The handling process, from bread wrapping machines to trucks, is geared to the shelf arrangement in the trucks. Complete mechanization of the conveying system running to the truck dock has enabled the company to reduce overall time of bread production and loading—even with the twelve varieties of packaged products made.

System Is Versatile

The wire conveyor "belts" move the packaged loaves from the 13 wrapping machines (any 5 at a time) to a master switching station. Here, the bread is fed onto any of 5 wire "belt" conveyors (tiered one on top of another) leading to the loading dock.

There, six men (formerly employed to handle the bread in racks and hampers) can quickly load the fleet of 74 trucks. These men, called "preloaders," check each driver-salesman's order—hung at the rear of the trucks backed up to the loading platform. And as each conveyor moves in a different type bread or package to the platform, preloaders fill the truck shelves.

Previously, the drivers themselves made up their loads from bread stacked in racks and hampers. Now they devote all their time to delivery and selling.

The preloaders may not completely load each truck at one time—being dependent upon the varieties of bread coming along. The conveyors may be regulated through a series of push-buttons—each having its own motor drive and speed control—so that proper distribution volume is maintained on the five levels. The loaves are gradually switched over from the original five types of bread until all twelve varieties have been packaged and loaded into the trucks.

The conveyorized handling and efficient truck loading have eliminated congestion and confusion in the packaging department, and also eliminated in-plant bread storage.

Tailormade Loading Dock

A special truck loading dock had to be designed and built to insure efficient traffic control and proper dovetailing of the mechanized conveyors with the shuffleboard-shelf trucks.

The loading area (see drawing) is 335 ft. long and 75 ft. wide, and it is covered with a trussed roof. A narrow platform set at the height of the truck bed extends around the side of the shed—forming a continuous U-shaped platform. The delivery vehicles are backed up, 35 on one side and 39 on the other, for loading perpendicularly to both long legs of the U.

The five-level conveyors (two sets) enter the area through an opening in the plant wall and then travel along the wall side of the U-shaped platform. The preloaders are thus able to walk along the platform, check each truck's order form, and fill the shuffleboard shelves from the five-tiered conveyor, which is within easy reach by men standing back of the trucks.

When the trucks return to the loading area after completion of their routes, they are immediately gassed up at the convenient company pumps (see drawing for location). Next, they back up to a "return goods," or "stales" door—if necessary—and unload the left-overs. After this short stop, each truck is moved to a rack for washing, also to the servicing area if required, and then to the loading platform.

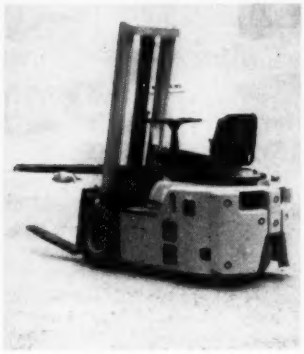
One of the unusual features of the Schmidt loading dock is a series of truck-exhaust gas vents in the face of the conveyor loading platform. The truck engine gases are exhausted into these vents, and then enter a duct. A fan expels them from the duct to a point outside the shed.

This ventilation system protects the employees working inside the loading dock building from monoxide gas, especially in the winter when the windows and doors are closed. It also protects all the baked products from possible contamination and off-taste.

Bodies for the Schmidt Bakery trucks, including the interior fittings necessary for installation of the special shelving, were turned out at the Boyerstown (Pa.) Auto Body Works. The shelves were supplied by Union Steel Products Co., Albion, Mich.

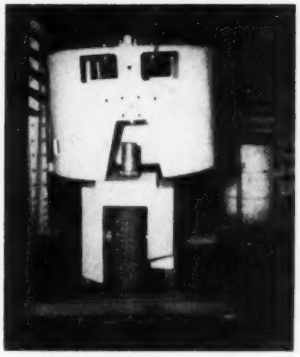
FRONT-FEEDING shelves are seen within cab as driver-salesman steps from truck. Bread slides forward automatically. Rear door needn't be opened.

NEW EQUIPMENT & SUPPLIES



With counterweight attached

Light built-in weight



Standard built-in weight

Optional Counterweight Ups Truck's Versatility

Engineering changes in the Model "20" lift truck are reported to have made this unit more versatile. A prime aim was to eliminate carrying of heavy counterweights when they are not needed, thus reducing operating costs.

After field study and testing, maker's engineers developed new upright assemblies and load arm pins which permit optional use of an additional counterweight, thus increasing or decreasing the load-center or load capacity according to need.

The 2,000-lb. capacity standard model (15-in. load center) is now available in a new version with 24-in. load center, incorporating design and mechanical changes thus made necessary.

An optional additional counterweight (3-piece assembly) is used to bring this new truck up to 2,000-lb. capacity at 24-in. load center. Counterweights bolt to rear of machine (left photo) with 8 capscrews, adding 2¼ in. to the overall length.

New uprights are identical in appearance and design to former type but are constructed of improved quality steel for greater strength. Load arm pins are heat treated, also for greater strength.

Also available is a new lightweight "skeleton" counterweight (center photo) that will be installed on the new-version truck on order at the factory, replacing the standard counterweight on the new version (right photo) and reducing weight of truck by 600 lb. With skeleton counterweight, Model "20" is rated 1,300 lb. at 15-in. load center and 1,000 lb. at 24-in. load center. There is no change in overall length.

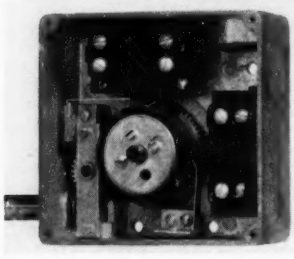
Skeleton counterweight makes unit one of lightest lift trucks for its capacity—especially applicable for use in older buildings with lighter elevators and limited floor loading capacity. (Surveys cited by the manufacturer indicate that a high percentage of lift-truck jobs are well within the 1,000-1,300-lb. load range.)

Redesign also makes it possible to bring lightweight model of new "20" up to standard capacity of 2,000 lb. at 15-in. load center and 1,500 lb. at 24-in. load center by adding the optional 3-piece additional counterweight.

Thus basic variations make possible various combinations in the same model truck.—*Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.*

Circle 117A on Reader Service Card

Rotating-Type Switch For Reverse Drive



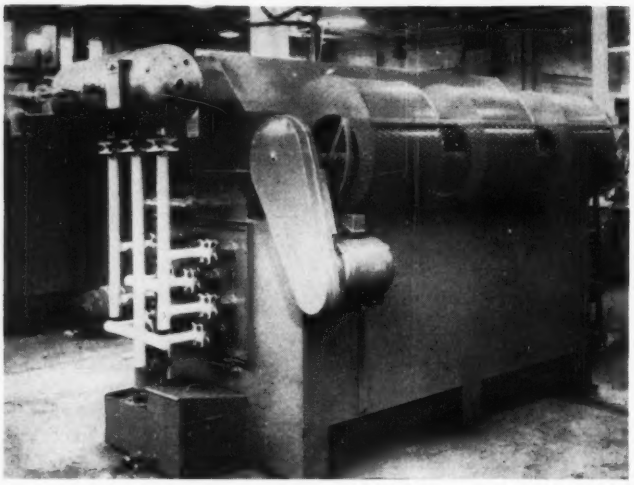
Where an alternating operation is to be coordinated with the number of revolutions of a motor shaft or driven equipment, this new rotating-type limit switch may be specified.

Switch consists of two Switchettes (Size 2), each having one normally open and one normally closed circuit. Switch units are operated independently by cams rotated through a worm and gear reduction from a shaft extending outside the case.

According to the maker's engineers, adjustment of the new limit switch is simply accomplished by loosening two clamping screws, turning slotted adjusting pins (one for each cam) to desired setting, and then retightening clamp screws. Switch can be adjusted to operate from 4 to 110 turns of driving shaft with 5 turns over-travel in either direction. And unlimited over-travel is termed possible without damage to the switch. All parts are accessible for easy installation.—*General Electric Co., Schenectady.*

Circle 117B on Reader Service Card

Improved Cooler for Foods Vulnerable to Drying



Just announced is an improved model No-Frost spray cooler designed for the refrigeration and storage of products sensitive to low relative humidities, especially foods which might dry out, shrink, discolor in cold dry air.

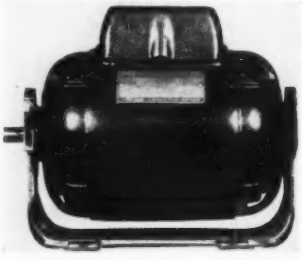
Equipment differs from previous models in that the air enters via fans and is blown through the units. Air passes over refrigeration coils and through a spray of "No Frost" solution, which prevents condensation of water and formation of ice or frost on coils.

Chilled air (it may be as low as −20 deg. F.) passes directly from the spray chamber into the room. Thus it contains no reheat from energy of the fans, and therefore higher-humidity air is made available.

With no accumulation of frost on coils, and hence no interruption for defrosting, cooling capacity is retained and there is closer control of conditions, with resulting improvement in quality of products held in refrigerated storage.—*Niagara Blower Co., 405 Lexington Ave., New York City 17.*

Circle 118A on Reader Service Card

Provides Smoother, Quieter Motor Operation



Resilient base construction, new on the Tri-Clad line of single-phase capacitor, induction motors, is designed to provide freedom from vibration and extra-quiet operation. This construction is available on motors rated ½ to 5 hp.

According to company engineers, all single-phase motors have some torque pulsation, but resilient base isolates this vibration so that it is not transmitted to driven machine.

Dynamically balanced for smooth operation, motor offers triple protection against physical damage, electrical breakdown, and operating wear and tear. Of cast iron construction, it features a totally-enclosed built-in transfer switch to keep foreign matter from contacts, and a centrifugal mechanism designed for long life.

Except for the 5 hp. size, which uses 230v. only, the new motors operate on 115/230v., 60-cycle power supply. Automatic-reset thermal protective devices are available for use with the 1 and 5 hp. 1,800-rpm. models. —*General Electric Co., Schenectady 5, N. Y.*

Circle 118B on Reader Service Card

Central Control Marks Rotary Can-Washer

This new, compact Roto-Master, featuring centralized control for easy operation, is reported capable of washing 180 cans and covers per hour.

Unit is comprised of motor-driven rotary turntable made up of removable can carrier plates and station divider panels. These parts are supported on a center drum through which the turning effort is applied and which also serves as a reservoir for makeup washing solution. All of above parts can be disassembled and removed through loading position without use of tools.

Drive consists of a five-position Geneva wheel directly keyed to a center shaft which also supports turntable. It is powered by an ample fractional hp. motor. Thermal overload switch on motor will quickly turn off power supply should a stall occur, thereby eliminating chance of damage to motor or machine. After stalling cause has been corrected, thermal relay is reset manually to permit motor to be re-started.

In operation, a can and cover are placed in position on turntable through loading and unloading opening. First advance carries can and cover over pre-rinse jets, where city water is applied to inside of can and cover for 3 sec. Since this treatment is at very start of "idle" position, approximately 13 sec. are available for pre-rinse drainage. A large drain pan with separate connection to outside of washer prevents drainage from getting into solution water.

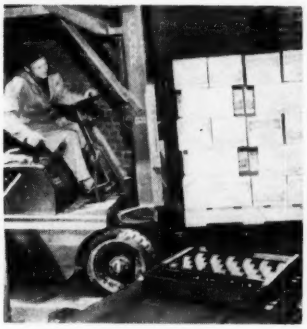
Can and cover now advance to solution wash station, where a high pressure pump sprays solution water both inside and outside of can and cover for 17½ sec. A solution temperature of 135 deg. F. is recommended.

Next advance brings cans to pre-rinse and sterilizing position. Here, a jet of hot water is injected into each can and cover for 4 sec. and then followed for remaining 13½ sec. by steam only. At completion of this treatment, both are sterilized and very hot.

Final treatment position is air-drying station. A high speed centrifugal blower sends approximately 500 cu. ft. of cold air into and around can and cover for the full 17½ sec. cycle. Turntable now revolves to the unloading position, where the clean can and cover are removed and an unwashed can and cover are inserted.—*The Creamery Package Mfg. Co., 1243 W. Washington Blvd., Chicago 7.*

Circle 118C on Reader Service Card

Dolly Speeds Loading of Refrigerated Carriers



Onto Dolly

Over Slats

Substantial labor savings in loading and unloading refrigerated cars and trucks are reported with use of a new pallet dolly.

Primarily built for use in refrigerated storage operations, the dolly affords maneuverability and ease of operation, thus conserving time and preventing tie-ups of equipment.

Dolly rides on 28 wheels, 24 of which are located in central portion and 2 on each end (left photo). The central wheels are placed slightly lower than end wheels, allowing a rocking motion that aids in moving and guiding of pallet loads.

The center wheels are on off-set axles to prevent lodging of wheels in slatted floors (right photo) employed in refrigerator cars and warehouses. Rubber tired and having ball bearings, these wheels measure 6 x 2 in. and are in tandem. End wheels are the same size but have hard treads. They are spaced on spring-loaded axles which permit them to move as the load is guided to its destination.

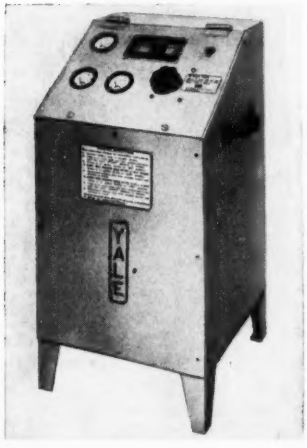
Overall, the dolly is 40 in. long by 30 in. wide. Frame is formed steel channel with 4.5-in. vertical section.

In loading a car or truck, the dolly is placed near the car door. A fork truck lifts pallet load onto dolly frame, then dolly is rolled to point where load is removed. Reverse procedure is used in unloading. During a single operation, a crew of four can use two dollies efficiently. Maker states it is possible to unload 34,000-lb. in under an hour using these dollies.

Unit was developed by National Ice & Cold Storage Co. of California in conjunction with the manufacturer.—*Roll-Rite Corp., Oakland, Calif.*

Circle 119A on Reader Service Card

Battery Charger Obviates Maintenance



Operated on the selenium rectifier principle, a new 55 amp.-hr. capacity industrial battery charger is designed to give maintenance-free operation, prolong battery life, and save power.

These results are stated accomplished primarily by (1) an automatic controller governing the amount and time of charge, and (2) design which avoids moving parts.

Charger is said to reduce human element to a minimum. There are only three steps to perform: Plug it in, set clocks, and throw a switch.

As stated, no moving parts are employed. Employment of an extra large plate area does away with need for a fan, and there are no commutators or brushes to be lubricated or create friction.

With dual clock control, charger affords protection to both new and old batteries, whether fully or partially charged either in a cold or warm area. To accomplish this, temperature compensation is built in.

Available for either lead-acid or nickel-alkaline batteries, unit can be plugged into any standard 110/115v. 60 cycle outlet. No special wiring is necessary. A step-down transformer is furnished for 220v. outlets. Other capacities for larger batteries will be available in the near future.—*The Yale & Towne Manufacturing Co., 11000 Roosevelt Blvd., Philadelphia 15.*

Circle 119B on Reader Service Card

Portable Steam-Cleaner Is Light, Handy to Use

Controlled, pressurized steam, for fast, thorough cleaning of food plant equipment is provided by a new compact, portable electro-steam unit weighing less than 20 lb.

With nozzle accessories supplied, including flexible 3-ft. extension hose, the unit enables removal of soil and contamination from complex equipment that might otherwise require disassembly to clean. Preparation for use requires only filling the tank with ½ gal. of water and plugging unit's cord into any standard wall socket.

Unit is well designed for safety. Though normal operating pressure is 90 lb., each tank is tested to withstand a pressure of 500 lb. Thermostat controls water temperature, and safety valve releases pressure at 100 lb. Outer casing of unit is well insulated from tank, permitting comfortable handling in operation.—*The National Steak Machine Co., 14510 Bessimer St., Van Nuys, Calif.*

Circle 119C on Reader Service Card

In the great American food industry, Patapar does so many jobs so well!

Patapar Vegetable Parchment has high wet-strength. It is boil-proof. It resists grease. It is odorless, tasteless, sanitary. Its texture, rich and beautiful.

Plain or beautifully printed in one or more colors, Patapar is ideal for wrapping and packaging all types of perishable foods. It is used for wrappers for butter, meats, frozen foods, margarine, bacon, celery, ice cream, lard; also can liners, milk and cream can gaskets, ham boiler liners and many other purposes.

Standard weights and types of Patapar are ideal for most uses. When unusual problems arise, we are glad to recommend special types. All told, there are 179 different types of Patapar, tailored to meet exacting requirements.

Tell us your problem and we'll send information plus a copy of Booklet T, "The Story of Patapar."

This Keymark, nationally advertised symbol of wrapper protection, can be included on printed Patapar wrappers.

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HI-WET-STRENGTH
GREASE-RESISTING PARCHMENT

Paterson Parchment Paper Company • Bristol, Pennsylvania
Headquarters for Vegetable Parchment since 1885
West Coast Plant: 340 Bryant Street, San Francisco 7, California
Sales Offices: 122 E. 42nd Street, New York 17, N. Y. • 111 W. Washington St., Chicago 2, Ill.

Conveyor Length Can be Readily Varied

Systematic handling of goods during assembly, inspection, sorting, order-packing, and similar operations, is reported attained with use of this new horizontal belt conveyor. Called the Table-Veyor, new power unit brings assembly-line efficiency to operations that are frequently production bottlenecks.

The versatile carrier is adapted to a wide range of plant and job conditions. Its length may be varied from 10 up to 60 ft. by adding or removing 5-ft. sections. If plant production needs change, conveyor can easily be altered to meet the new conditions. Belt widths may be 10, 12, 16, 18, or 20-in. Also available are leaves to fit on either side of belt to increase table-top working space.

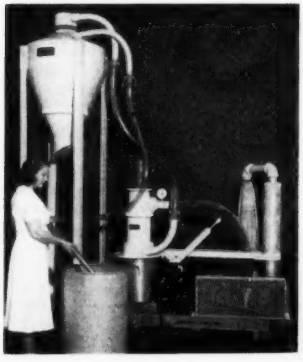
Height is adjustable from 21 to 40 in. Conveyor may be anchored to floor, or mounted on casters for portable use. Four-ply interbound solid woven cotton belt is standard. Other types are available.

Belt speed may be fixed or variable, from 5 to 100 ft. per min. Movement may be one-way or reversible. Motor is ⅓ hp. single or 3 phase.

Simplicity of conveyor construction allows any plant service department to install unit and also make later changes.—*The Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.*

Circle 121A on Reader Service Card

Air Conveyor Is Mounted on Hand Truck



Powdered products and granulated materials are reported readily transferred by this portable vacuum type air conveyor. Unit is designed to fill and periodically replenish supply hoppers or bins, also to empty boxes and shipping drums without dust nuisance and spillage occasioned when materials are dumped from such containers.

In operation, suction nozzle picks up product and conveys it through a flexible hose to a receiver located above the hopper of the machine to be supplied. A gate valve at bottom of receiver can either be manually opened and closed or be set for automatic operation. In latter case, material is fed into machine hopper by gravity until receiver is empty. Gate closes instantly when conveying system is started.

Air which enters receiver together with material goes through a high-efficiency cyclone head on top of receiver. Solid material is thereby separated from air and precipitated. A small amount of fine particles goes with air stream through a flexible hose to unit on truck which recovers them.

Centrifugal action of latter unit causes fine particles to precipitate into a dust hopper under separator. Air passes through separator, flexible hose, suction blower, and a filter bag for final interception of any remaining solids.

Dust hopper when filled can easily be replaced with an empty. For this purpose the separator (which normally rests on dust hopper to make an air-tight joint) is slightly raised by a leverage system.

Receiver is usually a 30-in.-dia. tank having holding capacity of 6 cu. ft.

Hand truck is easily pushed by one man. It is equipped with rubber tired wheels, roller bearings, and brake attachment. Small in size, it is readily maneuvered in plant aisles.

Separator has a fractional horse-power motor. Blower is a positive rotary suction unit with V-belt drive and 5 hp. motor. Overall specifications of truck with equipment: Height 65 in., length 66 in., width 30 in., total weight 1,040 lb.

All metallic equipment that comes into contact with material conveyed can be furnished in stainless steel.

Conveying rate varies with material handled and distance raised above floor. In unit illustrated, material enters receiver at a point 9 ft. above floor, and free-flowing materials (such as granulated sugar) are handled at a rate of 150 lb. per min. or 4½ tons per hour, while non-free-flowing powders (such as wheat flour) move at about 100 lb. per minute.—*Airborne Conveyors Corp., 99 Hudson St., New York City 13.*

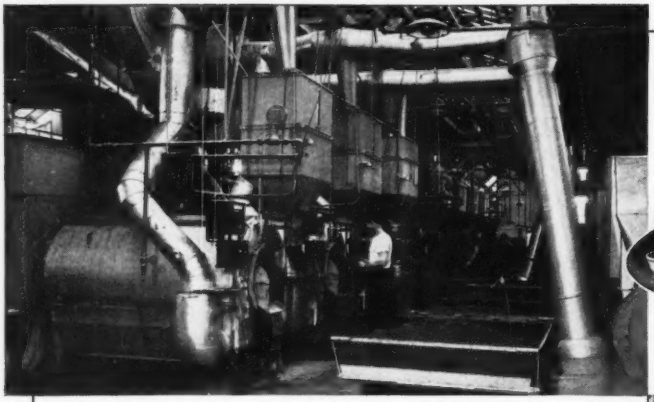
Circle 121B on Reader Service Card

Improved Valve for Refrigeration Units

Recent development is an improved suction valve of the plate type for use in refrigerating machines using ammonia.

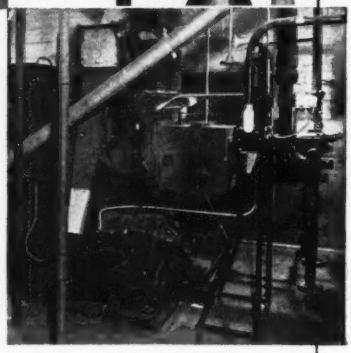
The new "Garland" valve, named after the manufacturer's chief engineer, employs extremely light moving parts. In addition, ring plate has an opening on each side, giving same port area with about half the lift.

Valve is a complete assembly, so



Battery of 9 batch Gas-fired coffee roasters. Gas burners fire vertically in combustion chamber, visible at extreme left.

Woolson official "cup tests" various coffee brands.



Gas burner equipment and controls at charging end of new Jabez Burns continuous roaster.

For Uniform Coffee Roasting

Woolson Spice Company

relies on GAS exclusively

FAST, UNIFORM ROASTING is essential to private brand coffees processing and packaging at Woolson Spice Company. This Toledo, Ohio, food manufacturer uses GAS in processing more than 10 tons of coffee per hour, and has been coffee-roasting with GAS exclusively for more than 25 years.

The original Jabez Burns coffee roasters employed a direct Gas-firing principle. These units were later modernized with Gas-fired air heaters with automatic controls, and the capacity of each roaster was increased 50%. The battery of 9 roasters has an output capacity of 25,000,000 pounds annually.

Increasing national per capita demand, now almost 19 pounds per year, recently required another expansion at Woolson Spice Company. Accordingly, a modern Gas-fired Jabez Burns continuous convection roaster was installed, bringing total annual production to 33,000,000 pounds.

For coffee roasting, or any other type of food processing, GAS has many advantages over other available fuels. The Woolson management expresses it this way: **"GAS is the only fuel which will roast our product economically, uniformly, and at the same time bring to each of our many blends the ultimate in consumer satisfaction."**

Your Gas Company Representative will help you take advantage of the modern methods of heat processing with GAS.

AMERICAN GAS ASSOCIATION

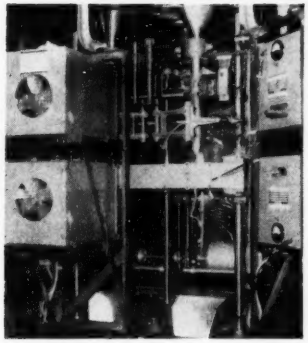
420 LEXINGTON AVE., NEW YORK 17, N.Y.

MORE AND MORE...
THE TREND IS TO GAS
FOR ALL HEAT PROCESSING OF FOOD

designed that no loose parts can get into cylinder. It is interchangeable with poppet valves conventionally used in ammonia compressors of vertical enclosed type. New units are reported carried in stock by distributors in principal cities.—*Frick Co., Waynesboro, Pa.*

Circle 121C on Reader Service Card

This Electronic Sealer Welds Many Films



This new sealing unit is reported to permit food industry use of many additional films through welding with electronic equipment. Unit is stated to adapt easily to Saran, Renalon, Vinylite, and Pliofilm.

Operations are the same as with the standard Transwrap equipment. However, in place of the resistance type heater, electronic dielectric heating equipment is utilized.

Illustration shows the mounting of electronic unit on the sealing assemblies of Transwrap machine. These units are readily swung clear for easy maintenance.

Equipment may be employed for gas packing, also for welding materials that "breathe."

Unit is reported simple in operation, in that the adjustment for each weld is made by regulating a control knob on oscillator and voltage control.

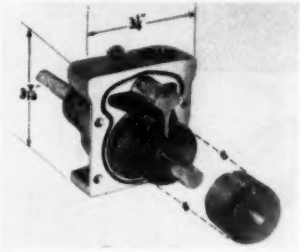
Machine flexibility allows a package size from 2 in. x 2 in. to 5½ in x 13 in. Changing of these package sizes has little or no effect on operation of electronic equipment. All changes can be compensated by adjusting the control knobs mounted directly on front of equipment.

Present operating speed is between 40 and 60 packages per minute, depending on material.

New equipment is available on production models now in assembly or for conversion of equipment now in field.—*Transparent Wrap Machine Corp., Hasbrouck Heights, N. J.*

Circle 123A on Reader Service Card

Compact Positive-Pump Has Special Impellers



A radically new line of positive-displacement pumps for use in small-volume process or laboratory work has been announced.

Known as "Allchem", the pumps employ impellers made of Teflon, a stuffing box packed with this same material, and also Teflon or Graphitar self-lubricating bearings. Stainless steel is used in casings and shafts.

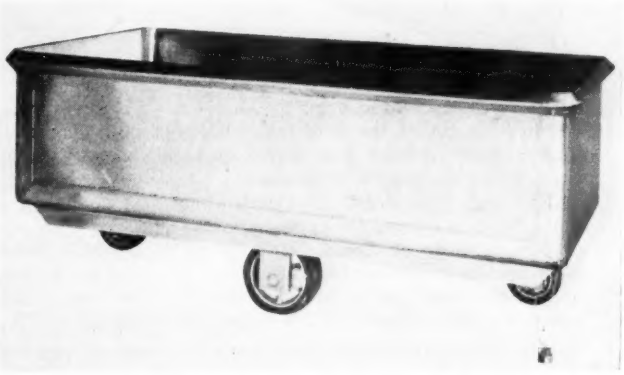
Maker states an all-around pumping unit is provided that will operate in either direction in capacities from 1 to 20 gpm. and at pressures up to 40 psi. with excellent lift. Capacities are subject to viscosity, temperature, and specific gravity.

The impellers are reported to be tough, resilient, and not subject to thermal-shock or galvanic attack. And it is said that they will not swell, shrink, harden or crack. They have a low coefficient of friction, zero moisture absorption plus non-adhesive properties. Pumps do not impart any taste, color or odor to product handled.

Units are available in pump-port sizes to fit ⅜-in., ½-in., and ¾-in. pipe taps, with pulley drive base assembly, or with base for connection to an electric motor.—*Eco Engineering Co., 12 New York Ave., Newark 1, N. J.*

Circle 123B on Reader Service Card

Sanitation Stressed in Truck Construction



This tub-type truck has all corners rounded, making it very easy to clean.

Stainless steel throughout, the truck has an interior carefully finished and polished to resist corrosion. Top edges are reinforced with a triangular piece of formed metal to stiffen the sides and resist damage. Removable plug (optional) in one corner allows contents to be easily drained.

Truck is furnished with any type and arrangement of swivel or rigid casters. Structure on which it is mounted may be of stainless or structural steel, galvanized or painted, and can be attached permanently or as a removable unit. Bearings are equipped with tested seals which prevent entrance of dirt and foreign matter as well as escape of grease.

Specifications: Capacity, 1,000 lb.; length inside, 60 in.; width, 26½ in.; and depth, 16½ in. Wheels may be cushion rubber, hard rubber, aluminum, plastic or semi steel.—*Market Forge Co., Everett, Mass.*

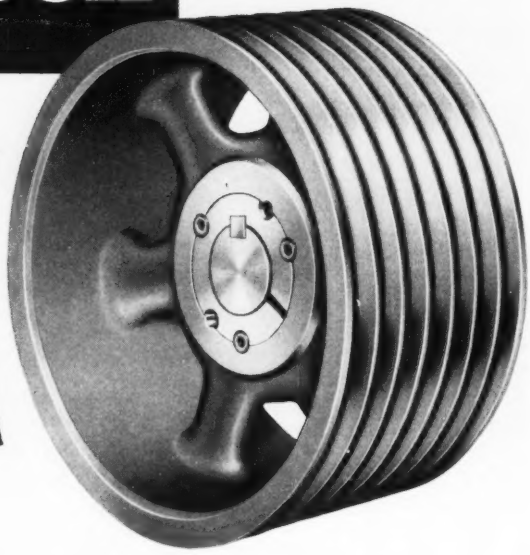
Circle 123C on Reader Service Card

There's only one
TAPER-LOCK

Precision-Grooved

True Running

Easy on—Easy off



TAPER-LOCK bushing grips the shaft for the full length of the bushing — holds sheave with firmness of a shrunk-on fit. No wobble. Taper-Lock runs true!

No flange—no collar—no protruding parts. Flush machine-tool appearance.

Finest grade of close-grained semi-steel, cast in the Dodge foundry.

The grooves, machined on precision equipment, have identical pitch diameters. This insures equal belt tension. Every belt pulls its share of the load!

TAPER-LOCK sheaves are available from distributors' stocks in complete range of sizes in A, B, C and D grooves.

DODGE SEALED-LIFE BELTS have special protection for tension members, insuring longer belt life. Perfectly matched to TAPER-LOCK sheaves.

DODGE MANUFACTURING CORPORATION, 2800 Union Street, Mishawaka, Ind.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.

FIRST IN POWER TRANSMISSION MACHINERY!

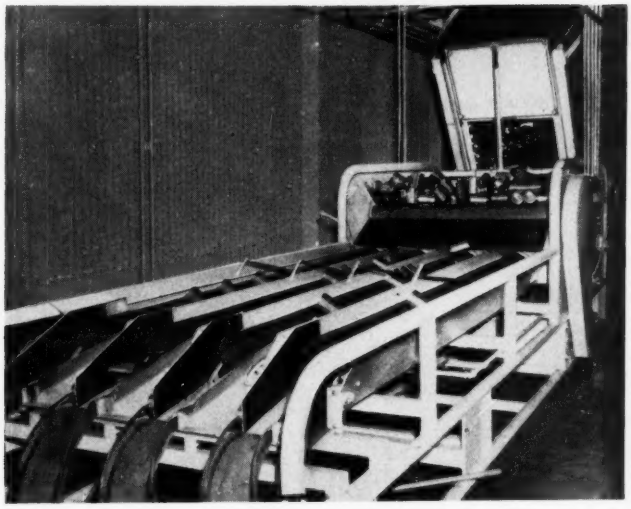
V-BELTS AND TAPER-LOCK SHEAVES

DODGE-TIMKEN PILLOW BLOCKS

ROLLING GRIP AND DIAMOND D CLUTCHES

SOLID STEEL CONVEYOR PULLEYS

Unscrambler Handles Retorted Cans Gently



Product damage on canned items like asparagus, figs, pears and whole tomatoes as a result of rough unscrambling after retorting is reported minimized by a new can unscrambler.

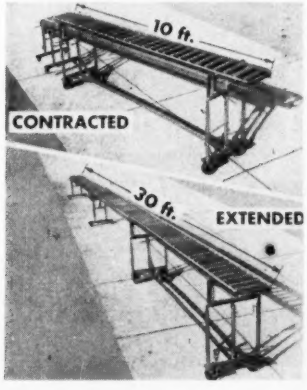
Unit handles tin sizes from 6 oz. to No. 2½. It is described as quickly adjustable by means of a single side-mounted lever. A gentle "roll-off" principle delivers cans to labeling lines at capacities up to 750 cans per minute. Handled are talls, ovals, flats and oblongs, as well as round tins.

Model 100, designed for use where smaller capacities are required, is a single-lane unit, but is adaptable to double-layer operation when cooker output is increased. Model 400 (pictured here) has four lanes in the standard 5 ft. width, and height is adjustable.

Unscrambling speed is increased by addition of basket dump, spreading tables, and elevators. All units have ball-bearing mounted movable parts and chain drive mechanism with electric motor.—*Dudley Machinery Corp., Mountain View, Calif.*

Circle 125A on Reader Service Card

Conveyor Length Quickly Altered



This new roller type, telescopic conveyor is easily "pulled-out" or "pushed-in" to accommodate the load for quick pick-up and delivery.

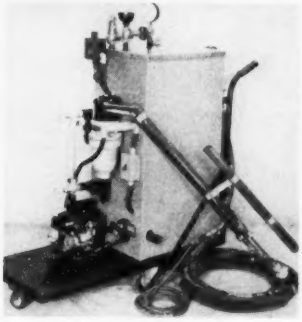
Mounted on heavy casters, the unit is readily rolled from one job to another and instantly set-up for action. Adjustable break-lock holds conveyor securely in position.

In storerooms, conveyor is used to save time and labor on short-distance transfers. Its flexibility permits adaptation to many moving tasks. On shipping platforms, mover may be run right into a truck, trailer or freight car so that carrying is reduced.

Roller type is supplied in 12 in. and 18 in. widths. Nine different lengths are available, with extension to a maximum of 30 ft. Conveyors are all-steel and accordingly rugged. When extended, sections pull up even. —*The Wilkie Co., 5520 Arch St., Philadelphia* 39.

Circle 125B on Reader Service Card

Velocity, Pressure Upped On Steam-Jet Cleaner



Quick and effective steam cleaning is obtained with the new Model JC-25 Speedylectric cleaner. New unit is stated to step up velocity of jet without adding appreciably to electric power requirements. It is built to operate at pressures up to 200 psi.

Combination of high pressure and a new twin-jet steam lance, with finger-tip control, gives high velocity and powerful cleaning action. Unit, 16 in. wide and 48 in. long, is designed for maximum portability in close quarters. Cleaner is completely self-contained, with space provided on the all-steel truck to mount a water tank of sufficient capacity for 3-4 hr. continuous operation.

Termed simple to operate, unit is described as cleaning facilities effec-

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For your convenience, too, all items in this department are listed and keyed in the Reader Service Section under "Editorial: New Equipment, Supplies."

FABREEKA

CONVEYOR Belting

New Bean Line Installation Equipped with Fabreeka 100%

WASHINGTON CANNERS
Cooperative
VANCOUVER, WASH.

"Extremely Economical under Continuous Wet Operating Conditions"

Washington Canners Cooperative at Vancouver specified Fabreeka Belting because of its rugged dependability, its ability to operate continuously under water, and to withstand all other factors encountered in the industry . . . also because it has minimum stretch, minimum shrinkage, continuous flexibility and tracks perfectly. The adjacent pictures show some of the many applications of Fabreeka Conveyor Belting in this outstanding canning plant.

It Pays to Specify Fabreeka

TOP: 12" wide 9-ply Fabreeka belts on 25' centers carry beans from Urschel 30C cutters to regraders and to sorting tables (3 Fabreeka 9-ply belts 24" wide) for final inspection.

CENTER: From McLauchlan washer (far R. H. corner) beans are elevated (30° pitch) on a 9-ply Fabreeka belt 12" wide x 30 - 38' long (cleated with ¾" wide Fabreeka cleats to a high speed (350 fpm 9-ply Fabreeka belt 12" on 35' center (not shown) which feed 7 CRCo double pregraders shown at top of photo.

LOWER LEFT: After snipping, beans are deposited on 6 picking table belts (all 24" wide 9-ply Fabreeka, traveling 15 fpm) for hand sorting, then are conveyed to cutters and regraders.

FABREEKA CONVEYOR BELTING IS WIDELY USED THROUGHOUT THE FOOD INDUSTRY

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FABREEKA PRODUCTS COMPANY
INCORPORATED
222-F SUMMER STREET, BOSTON 10, MASSACHUSETTS
NEW YORK CHICAGO DETROIT SPARTANBURG
PHILADELPHIA PITTSBURGH OAKLAND

tively, safely and silently. Maker says it may be operated in a crowded workroom without danger or annoyance to nearby operators at adjacent machines.

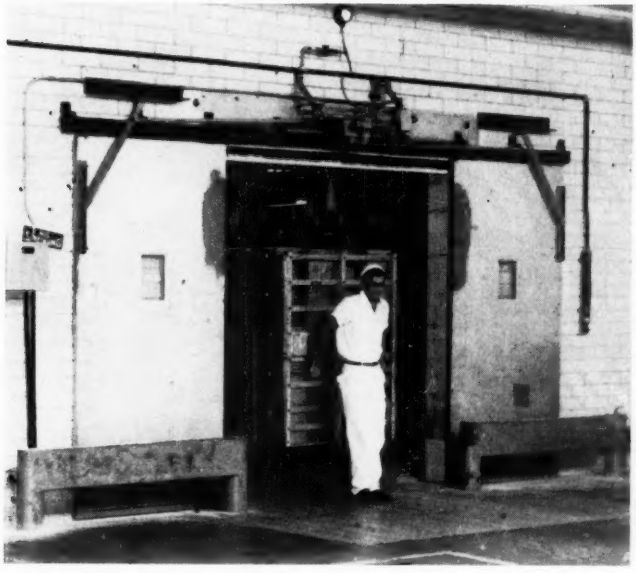
Cleaner uses steam from built-in high pressure electric boiler. Small quantities of solvents are used effectively. They are not diluted by mixing with gallons of water at the jet. Dirt, fats, dough and caked-on accumulations are stated to be melted away by the high velocity jet of hot dry steam and detergents applied. There is no flooding of the working area, no smoke, flames or fire hazard.

Unit is free of low water danger. Boiler water itself is the electric resistance heating element, and if there is no water, no current passes and no steam is generated. Boiler is built under ASME Code, carries National Board stamp, and is Underwriters' Laboratories listed.

Available for 220, 440 or 550, unit under ordinary operating conditions consumes 15 kw. per hour. It is reported that one man with cleaner does work of several men using hand operation methods.—*Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass.*

Circle 125C on Reader Service Card

Automatic Door Operator Is Simply Installed



Easy installation, low maintenance operation, positive-action opening and closing, and clear approaches and doorways are claimed with use of a new, automatic door-operator.

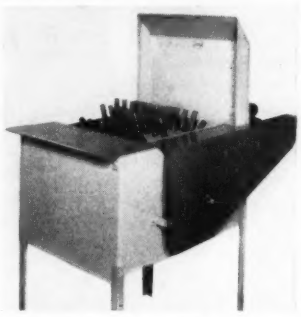
This recently-developed unit, called the NP "Electro-Field", employs a balanced high-frequency electrical system with a floor-installed antenna. Unbalancing of field by person passing over antenna actuates operating equipment and opens door. It stays open to allow safe clearance, then closes automatically. Door's return speed is slowed, as needed, to avoid slamming.

Opening and closing are by air pressure, and timing is adjustable to individual requirements.

Unit is stated to control all types of sliding, swinging, or folding doors. It is pre-piped and pre-wired for ready installation. No stanchions or uprights are used, hence doorways and approaches are unobstructed. Device is seen especially valuable in plants where temperature and humidity control are important factors.—*National Pneumatic Co., 125 Amory St., Boston.*

Circle 127A on Reader Service Card

New Poultry Picker Does Thorough Job



This mechanical poultry picker is reported to handle 500 chickens in eight hr.

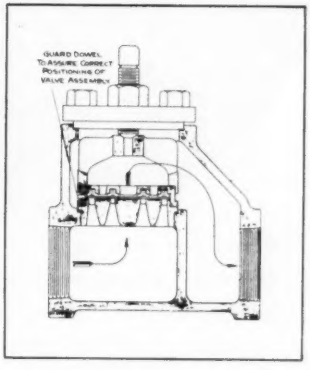
Called the "Kock Pickeroo" it was developed for those who process poultry on a moderate scale.

Flexible rubber fingers, with suction cup tips, have a wiping action, and drag off the feathers thoroughly without bruising the carcass.

Unit is driven by a ½-hp motor through a V-belt drive.—*Koch Supplies, 20th & McGee Sts., Kansas City 8.*

Circle 127B on Reader Service Card

Compressor Protected By Aircheck Valve



Damage to an air compressor through forgetfulness of operating personnel to open a valve is reported eliminated with use of a new air check valve.

Four additional advantages are claimed with installation of the valve on the discharge line of a compressor: (1) The unit dispenses with customary arrangement of stop, safety, and globe

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New Bean Line Installation Equipped with Fabreeka 100%

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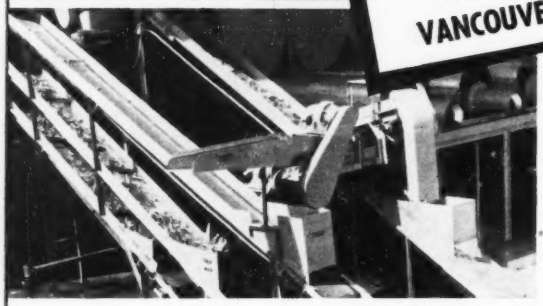

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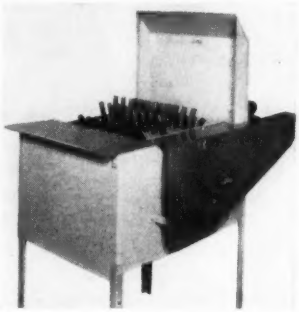

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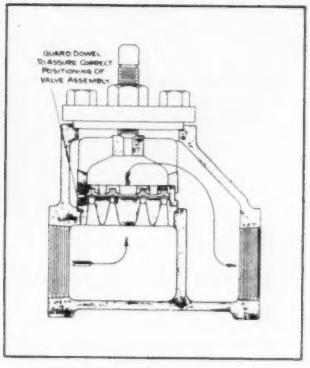
Compressor Protected By Aircheck Valve



Damage to an air compressor through forgetfulness of operating personnel to open a valve is reported eliminated with use of a new air check valve.

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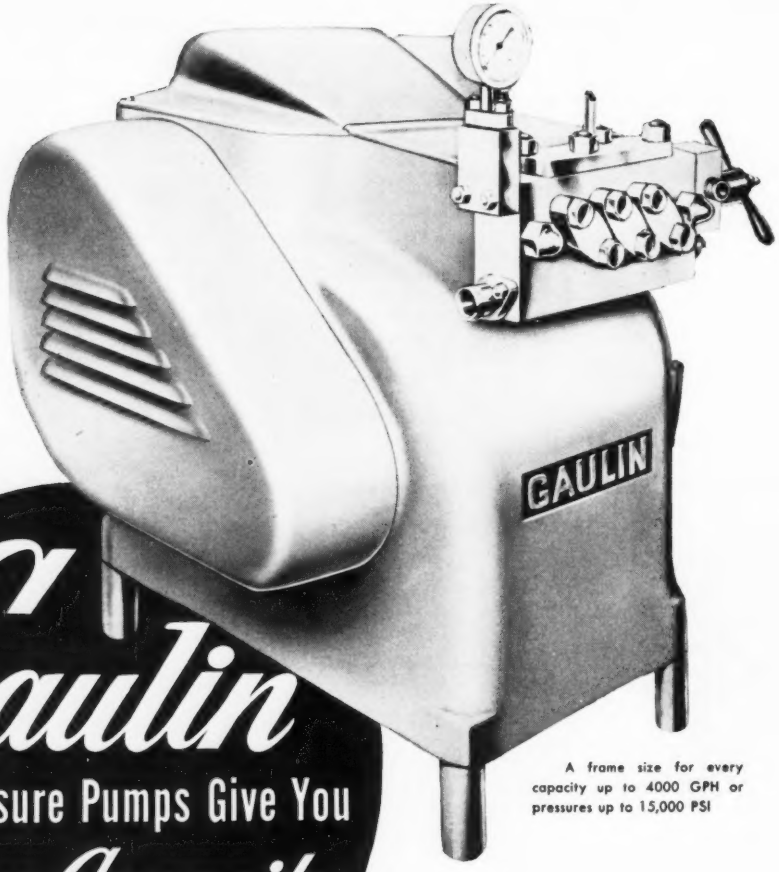

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Gaulin TRADE MARK

valves; (2) prevents leakage of pressure through the compressor during the "off" cycle; (3) dampens pipe line pulsations; and (4) permits repairs without shutting down the system where more than one compressor is on the line.

Valve is stated to be efficient and easy to maintain. The guard and seat are firmly locked by retainer ring, easily assembled and taken apart. Valve and disk are stainless steel. Air cushion prevents hammer of parts and contributes to quiet operation. Check valve cannot be wrongly assembled, since dowel pin prevents this.—*Pennsylvania Pump & Compressor Co., Easton, Pa.*

Circle 127C on Reader Service Card

"Reefer" Trailer Is Made of Laminated Plywood

Flexibility, strength, light weight, and effective insulation are reported as highlight features of a new, refrigerator truck trailer.

Called the Unicel, it is made by laminating strong plywoods grain-against-grain with plastics specially formulated for strength. The sections are then subjected to high-frequency heat applied under high pressure, this operation molding them into a single unit-cellular structure.

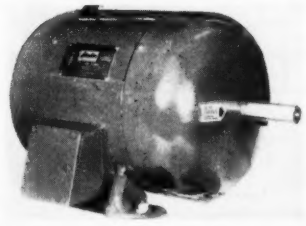
Only use of steel is in the trailer's heavy duty tandem and kingpin wearplate assembly and the door frames. In comparison with conventional construction, it saves 2 tons of metal.

Operating flexibility of the new "reefer" is keyed to the fact that it incorporates insulation in its own structure. Accordingly, truckers may "work" various shipments, in "going" or "returning" trips, without ever needing to put in additional insulation which would sacrifice space and weight capacities and thus cut down payloads.

Advantages detailed for the 32-ft. reefer are: Rigidity, making it easy to pull and handy to maneuver; higher cargo capacity, despite being lighter; effective insulation due to cell structure, keeping refrigerated loads colder at less overall cost; and non-rust structure. Trailer is termed easy to clean and keep clean.—*Pressed Steel Car Co., 6 N. Michigan Ave., Chicago.*

Circle 129A on Reader Service Card

Motor Takes Excessive Splashing, Hosing



Now being marketed are new Life-Line splashproof motors. They are for food industry applications where splashing or hosing down brings splashproofing demands exceeding NEMA standards.

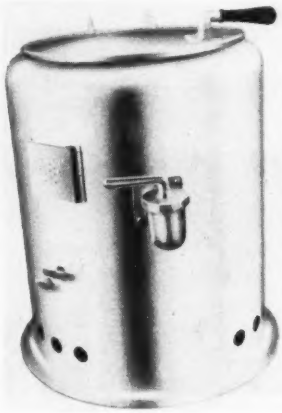
Motors incorporate gasketed cast iron conduit boxes with provision for attaching waterproof conduit. Motor windings are given multiple dips and bakes in moisture-resistant varnish.

Baffles inside rear splashproof hood prevent water creeping up inside hood. Neoprene seals on shaft outside housing give protection against entrance of water into bearing housing, even under severe hosing operations. For added protection, grease seals are located between outer periphery of brackets and splashproof hoods.

Motors are available in frames 326 and smaller. They use prelubricated ball bearings, and no further lubrication is required for the life of the bearing.—*Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30.*

Circle 129B on Reader Service Card

Aluminum Sanitary Kettle Shortens Cooking Time



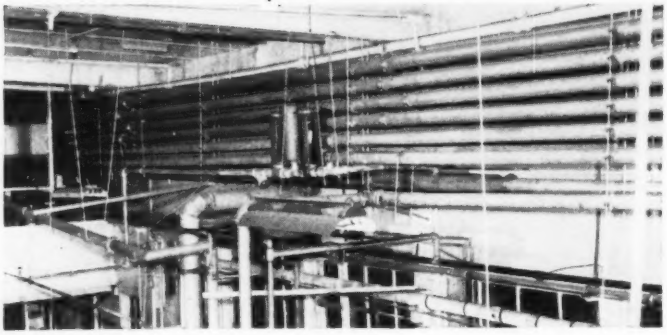
This new aluminum self-contained sanitary kettle is reported to save up to 50 percent cooking time on meats, with shrinkage held to a minimum. It is also intended for preparing fresh fruits, vegetables, and pie fillings, as well as meats.

Cooking is done by gas heat, applied directly to a heavy gage seamless aluminum shell, from specially designed Pyrastove burners. Rapidity with which aluminum spreads heat enables entire container to contribute to the cooking.

Kettle is available with two types of removable inside containers—one having a smooth, rounded bottom for easier stirring with convenient lift-out handles, the other equipped with a tangent draw-off and an easy-to-clean valve providing sanitary protection and making kettle-emptying easy.

Pyrastove burner is stated to permit fuel savings through very fine burner adjustments when only a low

You Get Sanitary Processing plus Easy Clean-Up with *Carpenter* Stainless Tubing



◀Hydraulic pressure blancher suspended from ceiling to save floor space. Temperature is regulated by controls which pass live steam through the jacket around perforations in the tube. Foods in process travel 1,100 ft. through the 4" dia. Carpenter Stainless Tubes. Product quality is safeguarded and clean-up time is low because of the smooth I.D. surfaces of Carpenter Stainless Tubing.

To help you conserve Stainless and get best possible fabricating results, Carpenter has published a new Slide Chart on Bending Stainless Tubing and Pipe. It shows desirable radii for bends of 45° to 180°, coil diameters for $\frac{1}{8}$" to 4" Stainless Pipe, etc.

A note on your company letterhead will start this new Carpenter Slide Chart on its way to you.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Department: Carpenter Steel Co., Reading, Pa., "CARSTEELCO"

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STAINLESS TUBING

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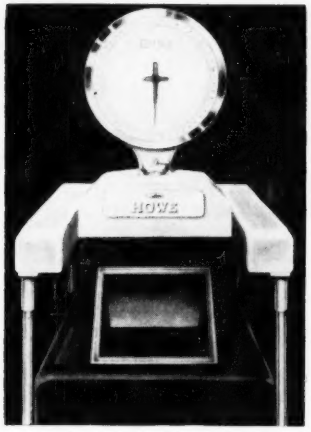
temperature is required. Burners can, it is said, be turned down to less than 10 percent of maximum input without flash-back. Tips are of low chrome alloy for resisting corrosion that can clog parts and make repairs necessary. Burner is light in weight. —*Aluminum Cooking Utensil Co., New Kensington, Pa.*

Circle 129C on Reader Service Card

Self-Contained Scale Uses Little Space



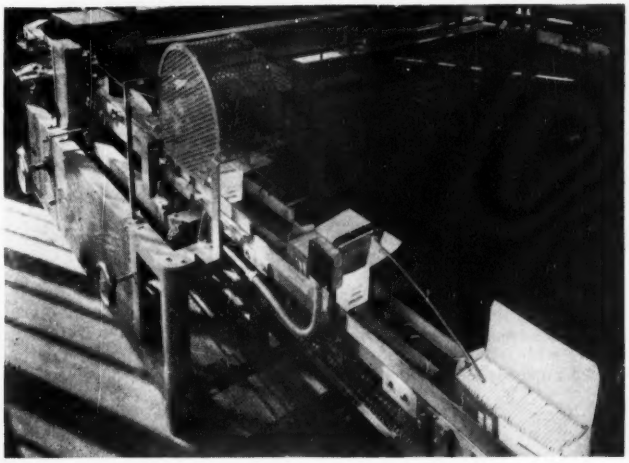
An addition to the Howe line of tape-drive dial scales is this new unit designed for use in dairies, creameries, milk receiving stations, butter, cheese and ice cream plants. Adaptable to any type of milk receiving room layout, it occupies little space and can be moved and re-installed as desired.

Unit employs no racks or pinions, and "positive drive" operation prevents loss of motion or backlash. There is a 300 percent increase in strength of tapes, which are self-aligning and held in position by a patented button connection. The scale is unaffected by changes in temperature and dial is sealed for protection against moisture, dust and vermin. There is no wear on working parts other than that on the ball bearings. Additional features are stainless steel parts in the lever system, and a 20-in. dial that can be set for reading at any angle.

Unit is finished in baked Hammerloid, light blue-gray. Ball bottom pipe legs are designed in accordance with milk industry requirements.—*Howe Scale Co., Rutland, Vt.*

Circle 131A on Reader Service Card

Carton Closer Adjusted Speedily for Size



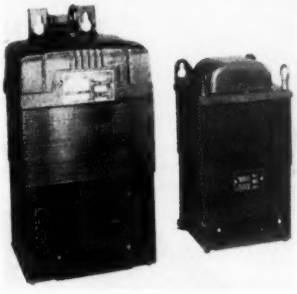
Seen here is the new completely automatic carton closing machine that recently completed inaugural operations at the plant of Robert A. Johnston Co., Milwaukee, candy and bakery goods producer.

The machine is designed to fold and close a wide variety of open-top type cartons. Featured is on-the-job adjustability. Dual controls permit quick carton size changes. Speeds from 30 to over 100 cartons per minute are reported attainable on lined or unlined cartons in continuous operation. Machine is stated to be self-clearing and vibrationless. It requires a minimum of floor space.

Installation (see photo) includes a gluing mechanism and a compressor unit which automatically seals cartons as they are closed. This eliminates need for outside wrapper on cracker cartons, accomplishing savings in manpower, as well as savings in cellophane. Gale V. Cough, Johnston official, reports machine has enabled company to save considerable labor on the packaging line.—*Peters Machinery Co., Ravenswood and Leland Aves., Chicago 40.*

Circle 131B on Reader Service Card

New Dry-Transformers Are Smaller, Lighter



Announced is a new line of general-purpose, dry-type transformers featuring Class B insulation.

For single-phase, 60-cycle operation, new design provides smaller transformers at an average weight reduction of 30 percent throughout the line. According to maker's engineers, some models weigh less than half as much as units they replace.

Size and weight advantages are obtained, it is stated, through use of improved core steels and increased amounts of inorganic insulating materials. Insulation withstands higher temperatures in the copper windings —80 deg. C. rise over a 40 deg. C. ambient. And the corisil core (a grain-oriented, cold-rolled silicon steel, provides comparable losses at higher flux densities. Net result is less copper and steel per kva. of output.

Redesign was undertaken in an effort to furnish industry with maximum number of transformers that can be produced from presently available supply of critical materials.

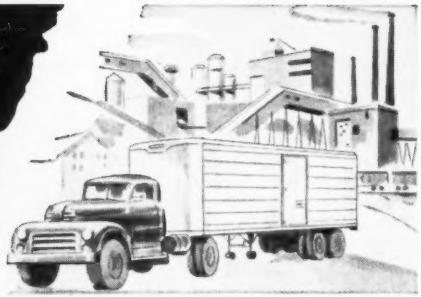
Certain ratings of new line are available immediately; others are be-

Whatever your hauling requirements...

THERE IS A

TRAILMOBILE

FOR YOUR NEEDS



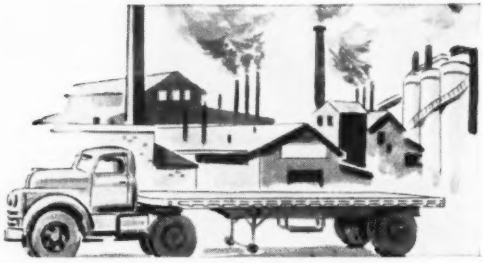
FREIGHT VANS

The Trailmobile van line includes closed and open top models for general freight hauling; insulated and refrigerated bodies for perishable foods; rack type bodies for grain and livestock and drop frame vans for moving or bulk hauling.

Pick the trailer for your job from a complete line of Trailmobiles. Here is a line that includes a wide variety of body types with a choice of optional equipment designed to meet your individual requirements.

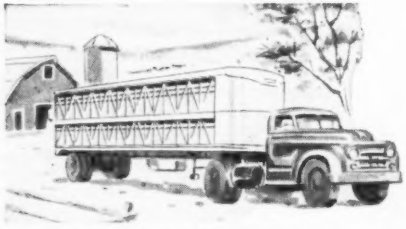
TANK TRAILERS

Trailmobile builds the only tank trailer on the market guaranteed against shell leakage. Trailmobile builds tank trailers and tank trains to haul gasoline, oil, kerosene, acids and asphalt. Also models for hauling bulk cement and for other special applications.



PLATFORM TRAILERS

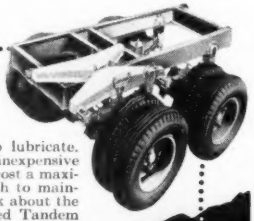
Tested models available for hauling heavy concentrated loads or light bulk loads. Platform trailers are versatile and indispensable for many transportation jobs in industry and on the farm.



MISCELLANEOUS

From industry to agriculture, from a simple dolly to an unusual tank type trailer, the Trailmobile line is complete. Other models include dump trailers, dump chassis, interchangeable drop frame chassis and 4-wheelers. The model shown is a cattle rack. You will find a Trailmobile to fit your special hauling problem.

The Famous **TRAILMOBILE** Tandems



Only two moving parts to lubricate. Trailmobile Tandems are inexpensive to operate, easy to service, cost a maximum of only $2.90 a month to maintain for a 5-year period. Ask about the new Trailmobile Guaranteed Tandem Plan.

The Trend is to **TRAILMOBILE**

TRAILMOBILE INC.

Friendly Service From Coast to Coast

Cincinnati 9, Ohio

Berkeley 2, California

ing added as quickly as manufacturing facilities can be converted. In all, line ultimately will consist of about 50 models in ratings of 3 kva. and upwards. It will include transformers equipped with two 5 percent rated-kva. taps below rated primary voltage; transformers for 32v. applications, for boosting and bucking applications, and for general light and power service; and autotransformers for general light and power service.—*General Electric, Schenectady, N. Y.*

Circle 131C on Reader Service Card

New Chemicals

Pan Cleanser Speeds Product Removal

Baked goods are reported removed quickly and easily from pans sanitized with a new, non-sudsing cleaner that prevents sticking. Thus, time is saved and baking loss minimized.

Known as Friespan, it is a concentrated emulsifying cleaner for use in mechanical washers, soak tanks or manual washing. Comprised of a blend of synthetics, it forms a non-caustic, non-toxic compound which, when properly employed, is called harmless to hands and equipment, yet is a powerful cleaning agent.

In washing operations, use of the cleaner is said to eliminate brushing of pans, to keep washing machine and racks free from scale, and to sanitize pans and utensils. It is stated to rinse freely without removing oxide film on pans. Further, according to maker, agent does not impart taste or odor.—*Fries & Fries, Inc., Detergent Div., Cincinnati 16.*

Circle 133A on Reader Service Card

New Glass Triples Alkali-Resistance

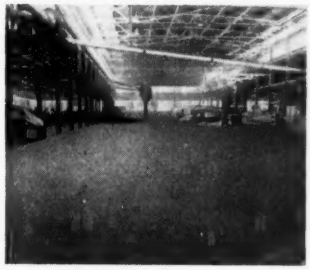
An improved, all-purpose lining is reported provided by a new acid-alkali-resisting glass recently developed.

It is intended for use in the pH range from 9 to 12 and at temperatures up to 212 deg. F. Laboratory tests within such ranges are cited as showing the new glass to have at least three times the alkali resistance of present glass and essentially the same acid resistance.

Several users applying the new product are said to have found that under some conditions it has several times more resistance than that named.

The glass is not intended for use with high concentrations of strong alkalis at high temperatures.—*The Pfaudler Co., 1000 West Ave., Rochester 3, N. Y.*

Circle 133B on Reader Service Card



Industrial Mastic Floor Resists Acids, Alkalis

In a new process for manufacturing industrial mastic floorings, Uintahlite, a mineral stabilizer, is utilized for the first time.

This substance is a mineral valued as a stabilizer and strengthener. It is described as providing high resistance to corrosion by acids and alkalis, liquid or gaseous.

Used in making the product designated as Texas Jack Resurfacer, Uintahlite is stated to impart strengths and resistances to the whole material when installed. It is reported to decrease dimensional movement to the point where possibilities of ruffing, waving, or transferring of old-floor irregularities through the new mastic surface are virtually nil.

Further it is reported that the "pull" on vehicular traffic is greatly reduced, while indentations under static loadings are claimed to be eliminated.—*Flash-Stone Co., 30 E. Rittenhouse St., Philadelphia 44.*

Circle 133C on Reader Service Card

"Hot Service" Paint Contains Silicones

Metals subjected to temperatures in the range of 200 to 1,000 deg. F are stated to be protected by a new maintenance paint.

Called "Thermalite," the paint reportedly gives protection in specific high-temperature applications on such equipment as boilers, kilns, exhaust stacks, and furnaces.

New product is an aluminum-type paint presenting a clean, smooth finish, combining good appearance with high heat resistance.

It is stated to differ from other aluminum maintenance paints in that it contains silicones, giving resistance to weather, chemical fumes, and salt spray. It is stated not to discolor, blister, flake or burn off in temperatures up to 1,000 deg. F.

Maker states it takes a temperature of at least 200 deg. (for 1 hr. or more) to cause it to "set" or fuse to surface. It must be used only on properly cleaned metal.

Paint may be applied by brush or spray, drying free from brush marks. A gallon covers up to 1,000 sq. ft., according to the manufacturer.—*Tropical Paint & Oil Co., Cleveland.*

Circle 133D on Reader Service Card

New Deodorizer System Handles Large Areas

Industrial odors are reported controlled by a new commercial deodorizer formulated specifically for large scale applications.

Employed is a liquid known as Renovair and a gyrostatic evaporator unit. Principle is the evaporation method of air conditioning.

Liquid product is stated to neutralize odors as it enters into the surrounding air. It uses non-toxic elements, such as found in plant life.

Evaporator unit, compact for easy installation in any air-conditioning system, is powered by the flow of air through it.—*Boyle-Midway Inc., 22 E. 40th St., New York City.*

Circle 133E on Reader Service Card

This Multi-Purpose Grease Has Wide Heat Range

Shear stability, resistance against water washing, and good pumpability at low temperatures are features reported for an improved multi-purpose grease.

Known as Multifak 2, it is recommended where requirements call for one high grade multi-purpose grease for a variety of operations. It is termed highly suitable for bearing lubrication over a wide range of temperatures.—*The Texas Co., 135 East 42nd. St., New York City.*

Circle 133F on Reader Service Card

In Behalf of Progress . . .

You Have Antidote for the Poison—Use It!

Truth will out, and justice does prevail.

For many months the food processing and manufacturing industry has taken it on the chin from zealots and misinformed do-gooders.

At Delaney hearings and in the press, these people have maligned the industry by claims and insinuations about dangerous chemicals in food. More, they have said that many processed foods have been made inferior in nutritive value and taste by the use of chemical additives as substitutes for "natural" ingredients.

People in the industry have had to stand by and take the abuse. They could not fight back effectively until some impartial scientific agency said "it isn't so."

Recently, the Food Protection Committee of National Research Council said just that.

This independent scientific body's pronouncement is of great value to the industry because it will have a sobering effect on future legislation and standards affecting the industry. And it could be of still greater service to the industry if the public were made aware of the points contained in the FPC statement.

So associations and companies in the food industry should make it an important part of their public relations activities to broadcast the points made in the statement. Certainly, every food and science writer and each radio and TV commentator should be told about them. And the editor of every worthwhile newspaper and popular magazine should have a copy.

Chemicals in foods will continue to be a hot topic for popular news mediums for a long time to come. And it will be particularly hot when revision of the Food, Drug & Cosmetic Act comes before Congress. Which means that writers, editors and commentators need accurate background information as a basis for proper evaluation of future developments and statements pertaining to the quality and safety of foods.

Here are key FPC points that should be brought to everyone's attention:

1. There is no justification for the exaggerated viewpoints that have been widely circulated.

2. Reliable food processors have not reduced the nutritional quality of foods or created inferior products by using chemical additives. To the contrary, the quality and sanitary characteristics of food have been improving.

3. Not only are the food and chemical companies safeguarding consumers, but so also are the U. S. Public Health Service, the Meat Inspection Service, the Insecticide Division of USDA, and the Federal Security Agency.

4. The Food, Drug & Cosmetic Act provides authority for public protection, the record shows.

And you can add to Point 4 the fact that federal regulations and standards, state pure food laws, and local ordinances and health agencies further guarantee safe, pure, nutritious foods.

If the industry doesn't get these points across, it will be missing the greatest single opportunity that has come its way to defend its reputation for integrity and public service.

The antidote for the poison spread by the zealots and sensation mongers is at hand. Certainly it ought to be used.

Food Technologists—Awake!

Manufacturing Chemists Association has let no moss grow on the chemicals-in-foods question. Unfortunately, the same cannot be said for the food manufacturing and processing industry.

The chemical industry is way ahead of the food field—which has the most at stake—in respect to crystallized ideas on the proposed amendment to the Food, Drug & Cosmetic Act.

In mid-January, MCA held an outstanding inter-industry conference on the problem of chemicals in foods. As a result of the conference, many aspects of the chemicals-in-food problem have been aired by experts. And through MCA's suggested modification of the law, an alternative to the Miller Bill has been spelled out (see page 189).

Now it is imperative that technologists, lawyers, and management in the food industry get on the ball to determine which is best from their viewpoint—the law as is, the Miller modification, or the MCA proposal. Or whether there is yet another, and sounder answer.

From where the food processor sits, the problem is quite complex—has many facets. And since the industry has much at stake, its representatives better be well prepared to present their views and evidence when the showdown comes.

The accelerated rate of progress in food improvement must not be seriously slowed—nor the incentive for research destroyed. Yet adequate safeguards are necessary. Public confidence in processed foods must be restored and maintained at the "never-worry" level. One or two scare cases—and especially more Delaney type investigations—can do a lot of damage to the industry.

Announcing

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NEW CATALOG

Tells how you get *guaranteed* fluid agitation results with the outstanding new *LIGHTNIN* "Series E" Mixers for open tanks and closed pressure vessels.

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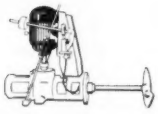
EVERY *LIGHTNIN* MIXER IS GUARANTEED TO DO THE JOB *RIGHT*

PORTABLE
⅛ to 3 HP



SIDE ENTERING
1 to 50 HP

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Please send me the new B-102 Catalog describing *LIGHTNIN* "Series E" Mixers. Also, please send the literature checked:

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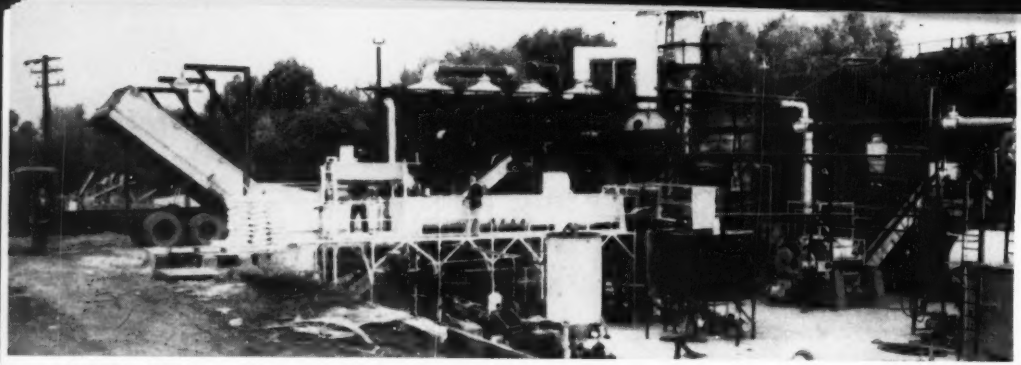
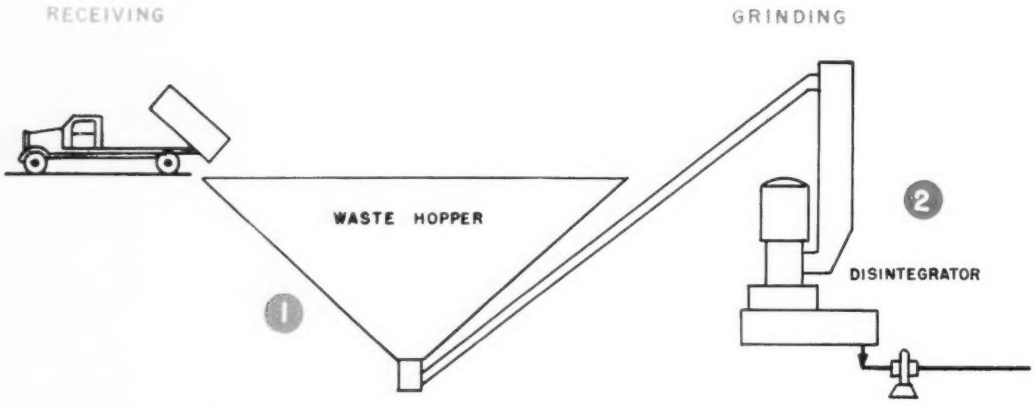


OVERALL VIEW of plant shows location of major components. Material from truck (left) is ground, next goes to horizontal treater (note operators on catwalk), then to drum press. From latter, juice flows to multiple evaporators (background). Solids go to rotary dryer (extreme right).

SANTA CLARA
PEAR-WASTE RECOVERY OPERATION



Making Pear Waste Salable

Molasses and Pomace for Stock Feed Are Recovered in Special Process

THE SMALL SCALE plant pictured and diagrammed on these foldout pages will process 150 tons of pear waste in a 24-hr. day.

A continuous operation, it was specially set up in a plant near San Jose, Calif., by the Western Regional Research Laboratory of California in a cooperative undertaking with the Canners League of California. Aim: Development of a practical method for utilizing pear cannery waste.

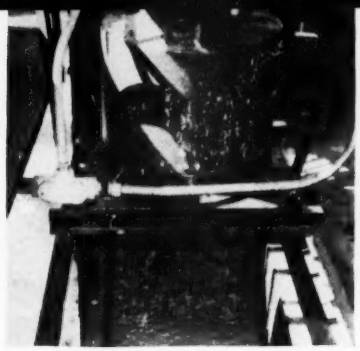
Waste in the form of partially drained peels and cores is received in water-tight trucks, or arrives in ground form in tank trucks. The latter is handled directly with pumps, whereas the unground waste is moved on an inclined elevating conveyor.

Grinding of both types of waste is carried out in a rigid-hammer disintegrator, and the resulting material is pumped at a constant rate into the mixing section of the continuous

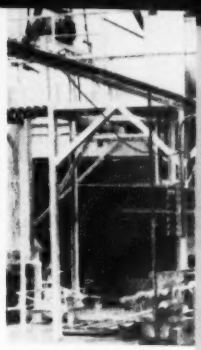
Don't Miss the Story Behind the Units

You'll find it recounted in this month's special feature article, "Advanced Fruit-Waste Recovery Will Roll Dollars *In*—Not *Out*" . . . On page 82.

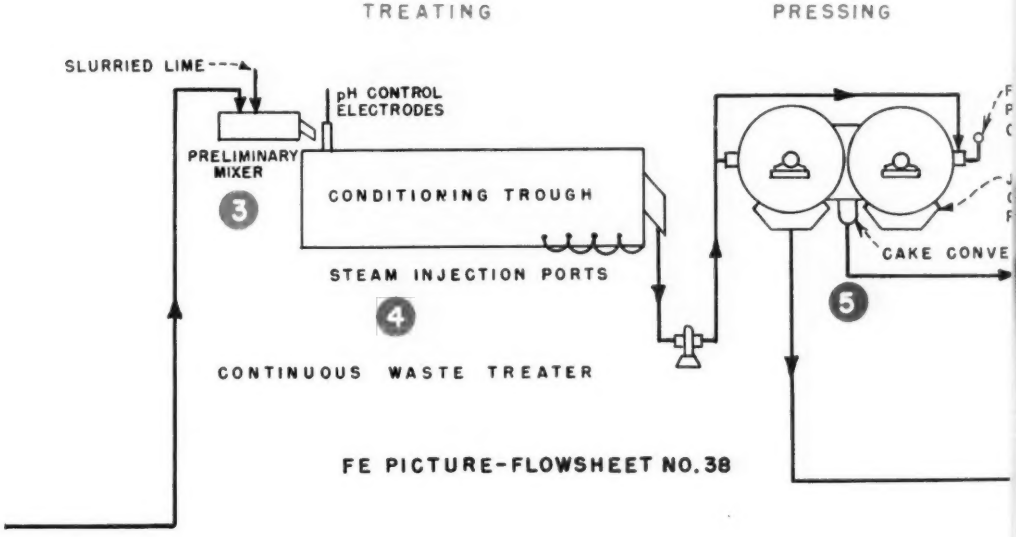
1 **PEAR WASTE,** from the canneries, is delivered to plant in water-tight trucks.



2 **IN THIS** rigid hammer disintegrator, all waste is reduced to a uniform consistency.



3 **CONTINUOUS** treat are mixed in first se



FE PICTURE-FLOWSHEET NO. 38

7

treater to raise the pH of the waste to the 8.5-9. range. Limed material leaves the mixing section by gravity and flows into a large trough fitted with a slow moving multiple-blade agitator—Point (4) in diagram. Blades are arranged to form an interrupted-flight conveyer. Physical action of these blades is essential to the successful treatment of the waste.

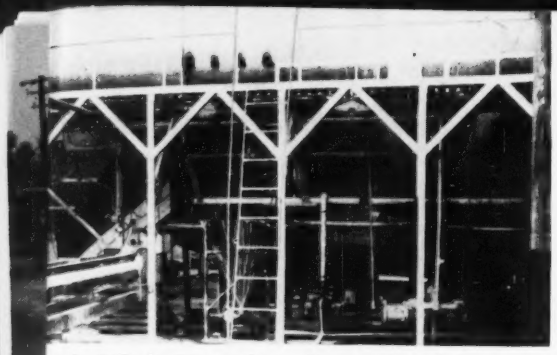
In the first portion, the blades cut the gel into small chunks, with very little crushing or breaking of gel pieces. Fine particles of waste are occluded in the larger pieces of gel. Continuous working of the gel particles promotes syneresis, so that clear juice is separated as the gel particles shrink and harden. De-esterification and reaction of pectin with lime, reduction of the gel to granules, and syneresis of the granules occurs during 10 min. of retention in the first half of the treater. In the second half, the partially-treated waste is slowly heated to 150 deg. F. by direct injection of steam at multiple points in the bottom of the treater. Syneresis of the particles continues throughout the length of the unit.

Treated waste is pumped directly to the continuous, double-drum dejuicing press. In the domed waste chamber of this press, the waste is maintained at a pressure of 2 to 5 psi. during a retention time of 2 to 3 min. During this period, a filter cake about ½ in. thick is deposited on the portions of the drums within the dome.

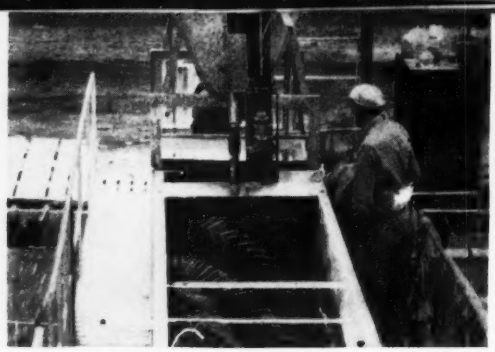
These cakes are continuously merged and pressed between the drums under a force of about 75 psi. along the line of contact between the two drums. The cake, containing about 25 percent solids, drops from between the drums into a conveyer, while juice flows through the filter surfaces of the drums and out into collecting pans.

This juice contains a small amount of press cake, derived from fragments clinging to the drum surface until dislodged by backflow of juice. The suspended material is removed from the press juice in an overflow centrifuge. The centrifuged, clear juice is concentrated in a multiple-effect, vacuum evaporator—Point (8)—to produce molasses containing 70 percent total solids (of which about 60 percent is sugar.)

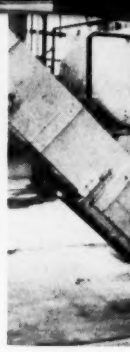
Wet press cake is crumbled in an interrupted-flight conveyor, then is fed to a direct-fired rotary dryer. Pomace, dried to a moisture content of about 5 percent, is cooled during air conveying to a storage bin. A screw-type loader is used to bulk-handle the finished pomace into trucks for shipment.



er is built in two sections. Pear waste and lime slurry tion, then mixture is conditioned in later section.



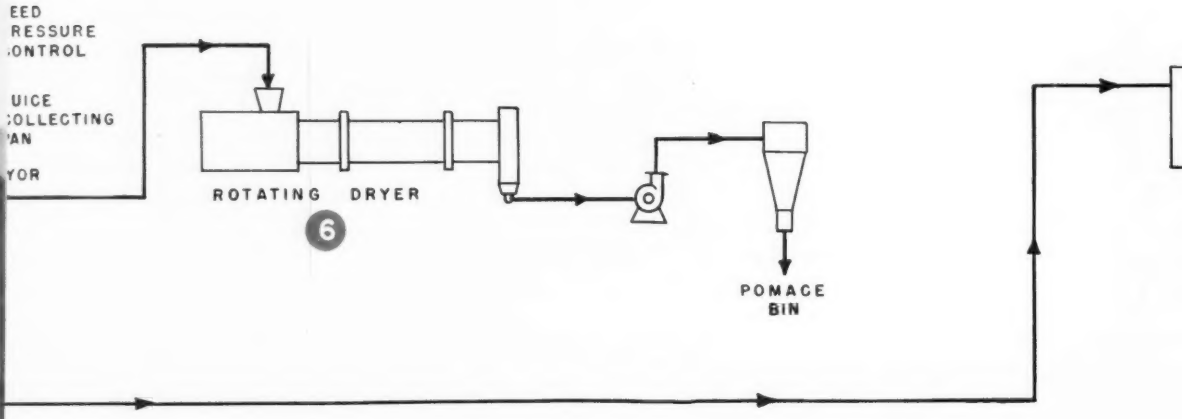
4 **TOP VIEW** of treater shows arrangement of blades on rotor in conditioning section of unit.



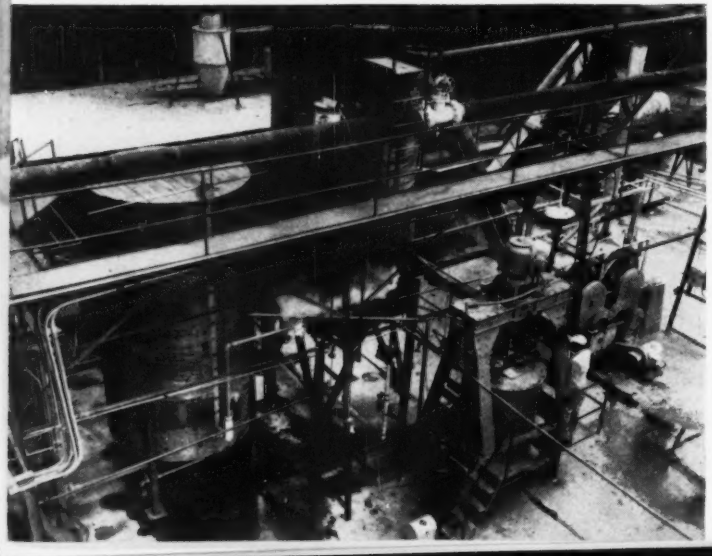
5 **DOUBLE-DR** combined fil

DRYING SOLIDS

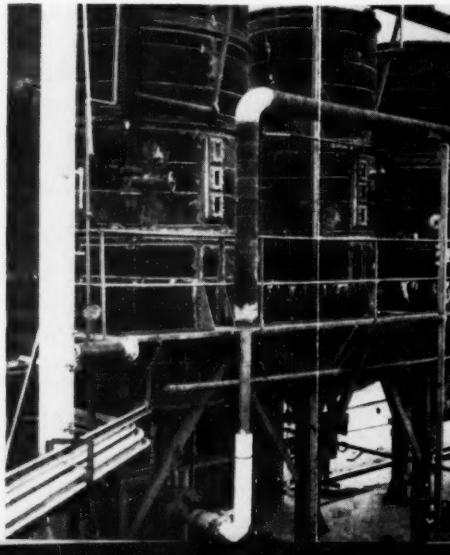
COLLECTING SOLIDS

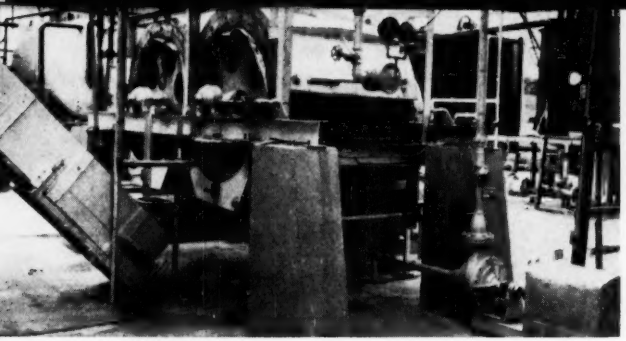


LOUDY JUICE from surge tank (left) is clarified by action of basket-type centrifuge ight foreground). Clear juice is pumped to surge tank (center).

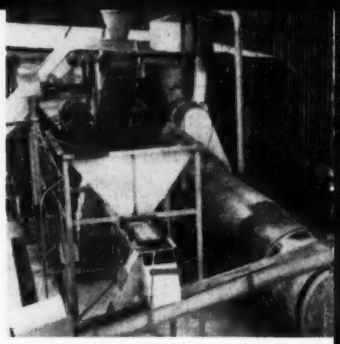


8 **MULTIPLE-EFFECT** evaporator co ncentrates juice taining 70 percent solids, 60 percent of which are su





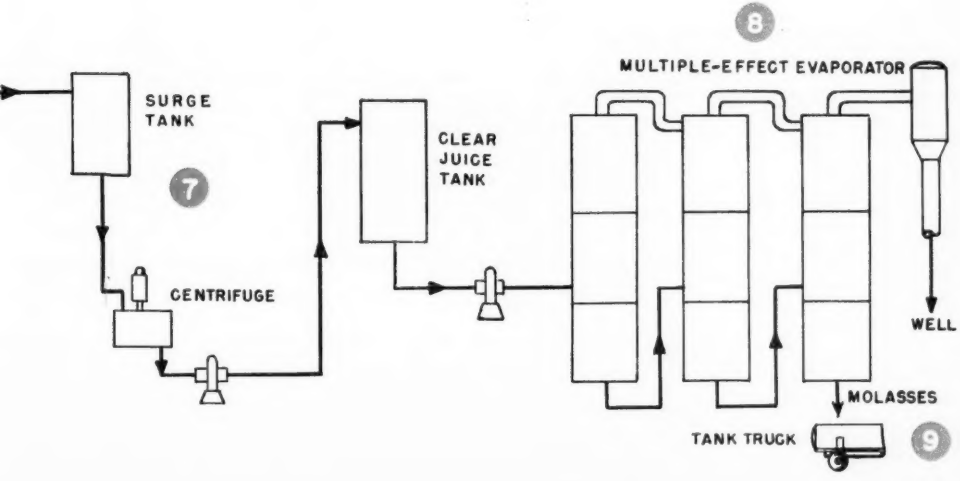
OUBLE-DRUM press continuously separates juice from treated waste in ombined filtering and pressing operation.



6 **PRESS CAKE** is reduced to finished pomace in rotary dryer (right).

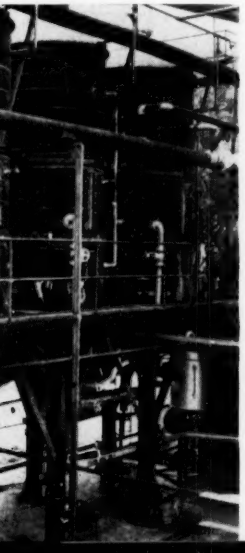
CLARIFYING LIQUIDS

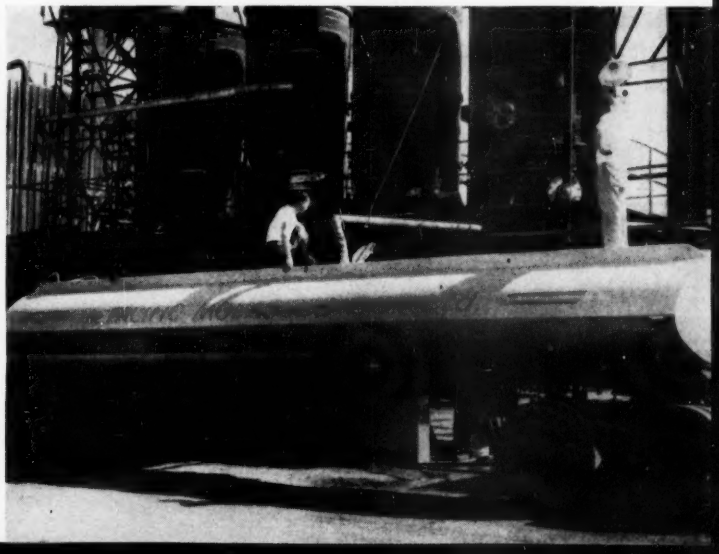
EVAPORATING LIQUIDS



ates juice to a molasses con- hich are sugars.

9 **THE FINISHED** syrup, is hauled from plant to stock-feed producers in 18 to 20-ton loads. Tank truck trailers are used as carriers.





COMPARISON PROVES the VALUE of VEELOS

the Adjustable V-Belt...

IF you use v-belts you'll be interested in this clear statement of facts about VEELOS, the link v-belt, and endless v-belts.

These 4 reels of Veelos provide up to 316 standard v-belt sizes.

COMPARISON TABLE
VEELOS and ENDLESS V-BELTS

what about...	Veelos V-Belts	Endless V-Belts
ADJUSTABILITY	*Any* length can be provided for *any* v-belt drive due to link construction.	Standard or special lengths must be supplied for *individual* drives.
INVENTORY	MINIMUM INVENTORY. 4 reels can care for every v-belt need in the O, A, B and C widths. No deterioration or obsolescence of spare belts.	LARGE INVENTORY. 316 sizes are required to provide a *complete* stock in the O, A, B and C widths. Spare belts not immediately used will age and deteriorate.
STOCKROOM STORAGE	SMALL SPACE. It takes less than 2 square feet of wall or floor space to store 4 reels of easily identified Veelos.	LARGE SPACE. Walls and ceilings are often covered with stocks of endless v-belts. Identifying and maintaining full stocks is difficult and costly.
INSTALLATION	Installs quickly *on any drive* without resetting motor or tearing down outboard bearings.	Necessary to reset motor and tear down drives with outboard bearings.
MAINTENANCE	Belts can be adjusted or replaced without moving the motor.	Sliding or pivoted motor bases are necessary to replace endless v-belts. Belts cannot be adjusted individually.
OPERATING EFFICIENCY	Full power delivery can be maintained because the tension of each belt in a matched set is kept uniform by removing or adding links.	Individual belts cannot be adjusted to maintain uniform tension and provide full power delivery.
DRIVE LAYOUT	No limitations are imposed by belt length.	Limited by the availability of standard or special belt lengths.

If you would like to learn more about Veelos—how it can save you money and keep your machines producing—write today for your copy of the Veelos Data Book. It's free and full of facts!

VEELOS
THE LINK
V-BELT

MANHEIM MANUFACTURING & BELTING COMPANY
MANHEIM, PENNSYLVANIA

... ADJUSTABLE TO ANY LENGTH ... ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof and static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

Are
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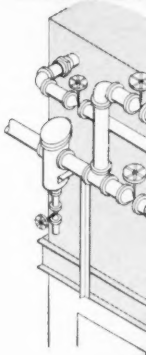
...on St



In steam supply
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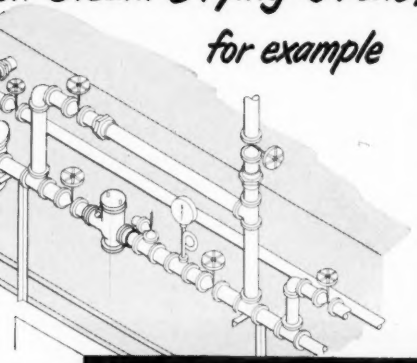
FOOD ENGIN

re Your Pressure Regulators oing As Well?

on Steam Drying Ovens, for example



THE INSTALLATION

m supply line to battery of 2 drying ovens at Chemical Corporation, Bedford, Ohio. Ovens dually controlled by thermostatic valves.

THE HISTORY

cations called for a valve to reduce initial pressure of 70 psi to 13 psi, and to maintain d pressure automatically without significant ion whether one, or both, or neither oven ated. Ovens to be operated at same or dif- temperatures, depending on process require-

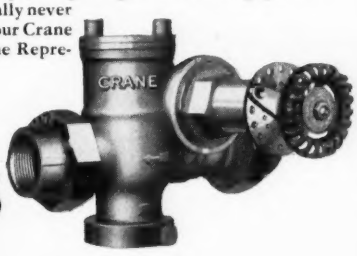
fications were met with one No. 960 Crane re Regulator, properly selected for capacity, talled with adequate drainage of condensate. rvice now more than 5 years without inter-, Crane Pressure Regulator is giving com- atisfaction. Working like new; maintenance date: zero. Remarkably simple to adjust.

VALVE SERVICE RATINGS

SUITABILITY:	Does everything claimed for it
MAINTENANCE COST:	None; working like new
CORROSION-RESISTANCE:	Steam only - corrosion no problem
SERVICE LIFE:	In 5 years; no sign of wear
OPERATING RESULTS:	No fluctuation of oven heat
PRICE:	Good buy
AVAILABILITY:	Regular Crane item

THE VALVE

Crane No. 960 Brass Pressure Regulator reduces 250-Pound steam or air inlet pressure up to 80%. Available for operation at any of 4 pre-set ranges within 1 to 200 pounds outlet pressure. Adjusts easily within any set operating range. All wearing parts renewable; virtually never wears out. See your Crane Catalog or Crane Representative.



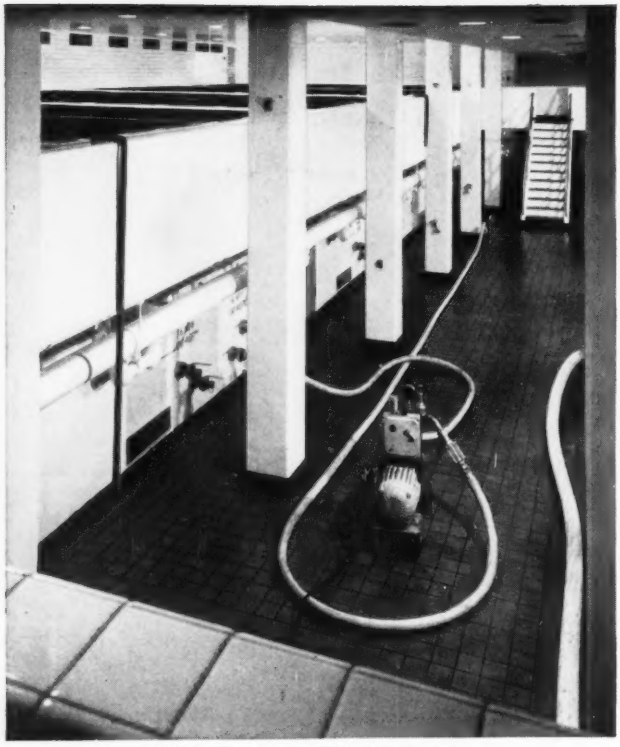
nplete Crane Line Meets All Valve Needs. That's Why

More Crane Valves Are Used Than Any Other Make!

RANE VALVES

RANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VES • FITTINGS • PIPE • PLUMBING • HEATING



Miller Brewing Company, Milwaukee, Wisconsin

no sanitation problems "brewing" here...

No question about sanitation in this modern brewery—the floors and walls are Mosaic Tile!

Specifications:

Mosaic Glazed Wall Tile, 4¼" x 4¼", Color No. 301. Floor—6" x 6" Navajo Red Mosaic Carlyle Quarry Tile.

Lawrence Peterson & Associates, Architects.

the walls and floors are Mosaic Tile!

Brewers know better than anyone the ruthless, costly war they wage against acids, moisture, bacteria and dirt to maintain critical Food & Drug Administration standards of sanitation!

Brewers *use* Mosaic Tile! They know Mosaic Tile resists caustic and lactic acids . . . blocks the "advances" of moisture and bacteria . . . cleans in record time with mop or hose . . . assures safer footing in "wet" areas, and never wears out!

Mosaic Tile is at work on walls and floors in brew houses, malting plants, cold storage and yeast culture rooms, bottling rooms and other areas where time-proof beauty and freedom from "dusting" are desired.

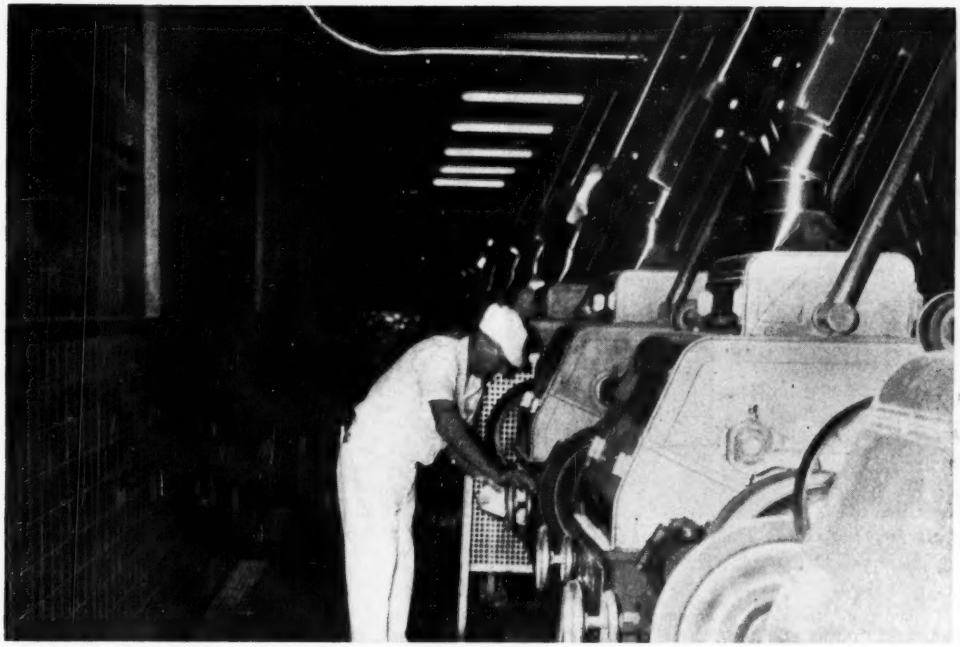
See for yourself how Mosaic Tile can *serve* and *save* you! Talk it over with your architect, builder, tile contractor, or write us at Zanesville, Ohio—address Dept. 25-7.

THE MOSAIC TILE COMPANY

MOSAIC®

(Member—Tile Council of America)

OFFICES, SHOWROOMS AND WAREHOUSES ACROSS THE NATION. OVER 4000 TILE CONTRACTORS TO SERVE YOU.



SPECIAL MATERIALS are employed in both equipment and plant structure. Roller mills are all-metal, spouts stainless steel. Window-free sidewalls use glass block and tile. Floor is also tile. Lighting is modern fluorescent.

Flour Mill Sets Pace In—

Engineered Sanitation, Efficiency

Major problems of dust, insect infestation, and materials handling are minimized by streamlined equipment and functional plant design

FE STAFF

By astutely refining long-established technics at its 12,000-cwt.-per-day Alton, Ill., plant, Russell-Miller Milling Co. has remarkably advanced the sanitation and efficiency of its operation.

The company's impressive boost to milling sanitation technology has seen infestation "engineered" to a new low. It is a performance which may be credited collectively to—

• **Higher ceilings that enable extensive sanitary spouting. . . . All-metal fabrication of equipment. . . . Company designed clean-out features that eliminate concealed pockets to speed sanitation activities. . . . Highly effective dust collectors. . . . A comprehensive system of Entoleters that destroys any possible insect life. . . . And frequent spot-fumigation of equipment.**

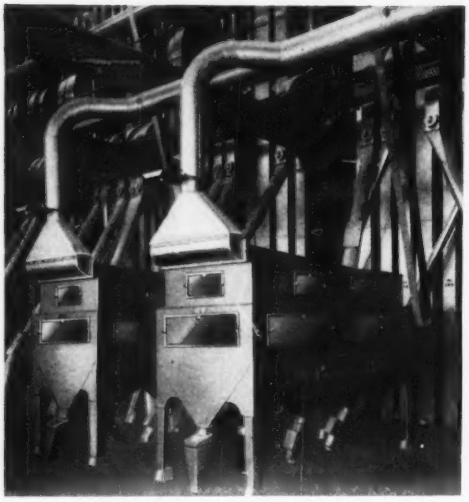
But before exploring these and other advanced engineering features of the Alton mill, a brief word about how the change came about and the physical factors involved:

In March 1946, the old Alton mill—which had been completely revamped only a few years before—was totally destroyed by fire. This had been a key R-M plant. Hence, the company set about building an entirely new mill from the ground up—one that departs from conventional lines of operation. Embodied are many ideas gleaned from long experience in flour production.

Outwardly, the new 136-ft. nine-story structure, finished in the fall of '47, looks like any other attractive modern mill. No windows are visible, since permanent glass-block panels are employed throughout. These provide excellent insulation for the completely air-conditioned interior.

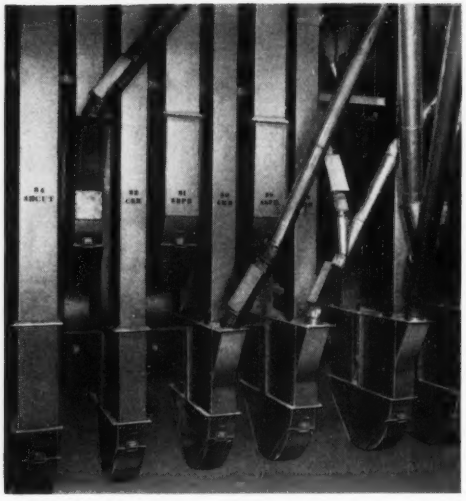
Inside the plant, aspects of the company's advanced thinking are quickly spotted. Primary eye-catcher is the unusually lofty ceiling on each floor—contrasting with conventional heights.

All Metal Units



SANITARY FEATURES of all-metal hopper-bottom purifiers typify improvements in equipment throughout plant.

Simple to Clean



ELEVATOR BOOTS are provided with off-the-floor, access doors that permit fast and thorough cleaning.

In laying out the new plant, company executives reasoned that increasing the distance between floors would greatly extend the distance mill stock could be spouted. Thus, they believed that if at least two floors were made 20 or 24 ft. high, handling of flour by sanitary spouting could be more extensive.

When this idea of extra ceiling height was carried out in the new plant it was calculated that 3,600 less linear feet of conveyor and 52 fewer elevator legs would be needed than in a conventional structure.

Extensive Spouting

An estimated 20,000 ft. of 2-in. galvanized, smoothly joined spouting gravitates the product in its many passes through this plant. This simple, gravity form of materials handling is entirely free of concealed pockets where flour can collect, and it effects important savings in maintenance.

Other eye-catchers in the plant are the many easy-to-clean construction details. For example, attractive tile wainscoating—joined to the floor in crevice-less fashion—covers all walls to the glass brick level. No wide dust-catching ledges are to be seen.

As a further aid to good housekeeping, there is no location in the plant inaccessible to the probe of hose and cleaning attachment from the three heavy-duty high vacuum-cleaning systems.

Closer inspection of the Alton facilities reveals how determined its planners were to best the problem of in-plant infestation. Pockets and dead spots in equipment—breeding places for insects—have been eliminated. For example, H. O. Olsby, Alton mill superintendent, specially designed a round-bottomed elevator boot which is suspended well above the floor. This boot is held in place by clips and is easily swung open for cleaning. Being raised above the floor it allows access to the space below for vacuum or sweep cleaning.

Another potential insect breeder had been the purifier. This unit was built of wood and depended on two or more integrated wooden conveyors for product discharge. The internal arrangement of these conveyors with their many valves, slides, and tin linings made them an ideal nesting place for bugs.

Charles A. Lang, vice-president in charge of engineering, suggested that hopper-type bottoms would make the proposed purifiers more sanitary. It was also suggested that aluminum might be a good substitute for the then-scarce rock maple used in the frame.

Resulting was the highly improved and vastly more sanitary all-metal hopper-bottom purifier that has since become virtually standard with manufacturers.

Other equipment units with smooth surfaced metal construction also were specified. No wood spouts or conveyors with tin linings or wood elevator legs are used in this mill. As a matter of fact, about the only wood used in the plant is that employed in the frames of high-speed sifters.

And no glass is used in the mill, except for the massive block wall panels. Viewing-windows on all equipment are of non-breakable plastic.

"Dustless" Milling

Perhaps the most outstanding aspect of the Alton mill is its freedom from dust—both inside and out. This is the result of a new company-pioneered system of air filters.

Need for a precedent breaking dust-collection technic was two-fold. First of all, the mill is located a short city block from a concentrated shopping district—and merchants usually find dust from a mill rather objectionable. So a "non-expelling" system was in order. Safety from explosion hazard was the other reason sponsoring the new system.

A filter which seemed well suited to Alton requirements in 1946 was the Hersey unit—a long tubular cloth filter with continuous self-cleaning features but with little prior application in milling. Mr. Lang adopted this filter to a tube 18 ft. high and of 20 in. dia. He retained the basic idea of a traveling annular ring jetting higher-pressure counter air through the cloth filter to periodically clean it.

High Air Capacity

All told, the suction systems in the new mill called for the handling of 100,000 cfm. of air. Tests showed the

new filter capable of dealing with up to 20 cfm. per sq. ft. of fabric surface, and even more if the airborne dust was neither damp nor sticky. But to be on the safe side it was decided to use a design factor of 10 cfm. per sq. ft. of fabric.

With the tubes of 20 in. dia. and 18 ft. high, this design figure of 10 provided an average air-handling capacity of 1,000 cfm. per tube.

Fans selected for the collector system were sized to allow a filter pressure drop of 3-in. static water pressure. However, in actual operation this was not reached except in the packing room system, where excessive dust prevailed. An extra bank of tubes in this area remedied the situation.

All systems throughout the plant operate on a pressure loss of ¾ to 1½-in. Trouble was expected with the break-roll suctions, where air and stock handled are both sticky and high in temperature and moisture. But such trouble did not develop.

An interesting and less obvious feature is the system's lack of expansion or dust-settling chambers in the air flow. All piping is arranged to maintain a high uniform velocity from air origin to filter tube. Here, the air passes out through the tube fabric, letting the dust fall into a special "air lock" discharge conveyor below.

In the filter tube itself the dust concentration increases from top to bottom as air passes out through the walls and dust keeps feeding in above.

Performance of the dust control system has exceeded company expectations. The original canton flannel tubes—costing only $5.81 each—are still in use in over 100 locations. It was assumed that these would require at least yearly replacement.

Much of the filtered air is often recirculated in the mill to maintain desired temperature and humidity. This supplements an air-conditioning system serving the plant through seven separate housings and ductwork. All told, the plant area accommodates over 2,000,000 cu. ft. of filtered, conditioned air.

Insect Control

Positive infestation control is exerted in the milling process. For example, more than 40 Entoleters are used in the wheat and flour flow system. All grain coming into the mill is subjected to high-speed centrifugal scouring and aspirating action by a bank of these units. And later, pre-break Entoleters remove by aspiration anything that manages to escape the initial treatment.

As a final quality measure all flour is rebolted (sifted) and passes through an Entoleter directly ahead of each packing machine. The company's non-compromising attitude is expressed here by the fact that there is no by-pass line from the sifting to the packing operations. All flour leaving the plant *must* pass through an Entoleter.

A rigidly followed housekeeping and inspection schedule is another part of the vital insect-control program. Besides a conscientious daily vacuum sweeping, the mill is shut-down once a month for a complete cleaning and fumigation of all equipment. A mixture of ethylene dibromide and methyl bromide is used as a spot fumigant.

As a further precaution, any returned bags or dubious materials coming into the plant are fumigated in a special chamber for at least 12 hr.

While the mill runs round-the-clock, all packaging is carried out during daylight hours. A group of 36 flour storage bins makes this possible.

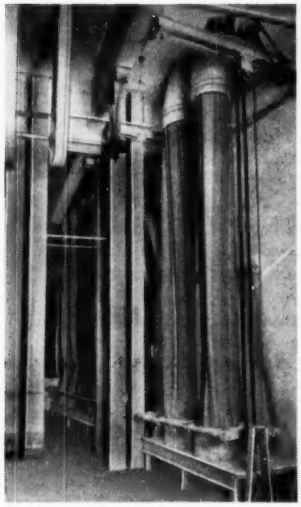
Movement of flour to bulk storage bins is through a unique, integrated network of conveyors and spouting. All bins are connected to the suction system so that airborne flour dust is pulled to, and collected in, a bank of nearby "Alton" filters.

Discharge of bulk storage bins is through double-tapered worm feeders equipped with variable drives. These feed the product to blending conveyors prior to re-bolting and packing.

Power utilization in the mill is highly efficient. There are 612 individual electric motors, but the main driving power is furnished by 8 heavy-duty synchronous motors supplying a total of 1,900 hp., with an average power factor of 94 percent.

The mill is lighted by 340 fluorescent fixtures. And an automatic-dial Stromberg-Carlson intercom system networks the plant in 42 separate lines.

Dust and Insect Eliminators



DUST COLLECTION system employs more than 100 Alton-modified filter tubes, seen along wall at right.

PRODUCT PURITY is protected by battery of over 40 Entoleters. Here, product flows down through sifters, then to Entoleters, whose high speed action destroys all insect life, before packaging.

Let You Forget About Atmospheric Hazards

Shown here are four basic types of Century Protected Motors which are designed to resist the dangers of hazardous atmospheres. A properly selected Century motor—with the right protection—is the ideal combination for a long life of satisfactory performance.

1 **Open Protected**—Form J, general purpose motor—meets the needs for most installations where operating conditions are relatively clean and dry. The top half of the motor frame is closed to keep out falling solids or dripping liquids.

2 **Splash Proof Motor**—gives the necessary protection where plants must be washed down—keeps water out of the motor even when a hose is applied directly on the frame. It also provides protection against rain, snow, sleet and ice for outdoor installations.

3 **Totally Enclosed Fan Cooled Motor** — protects against dusts, mist or fog that might be detrimental to the vital parts of the motor. The inner frame protecting the motor is sealed to keep out harmful matter.

4 **Explosion Proof Motor** — protects against atmospheres charged with explosive dusts or gases. They carry Underwriters' label for specific kinds of hazards.

Century builds a complete line of alternating and direct current motors in a wide range of types and kinds — in sizes from 1/8 to 400 horsepower.

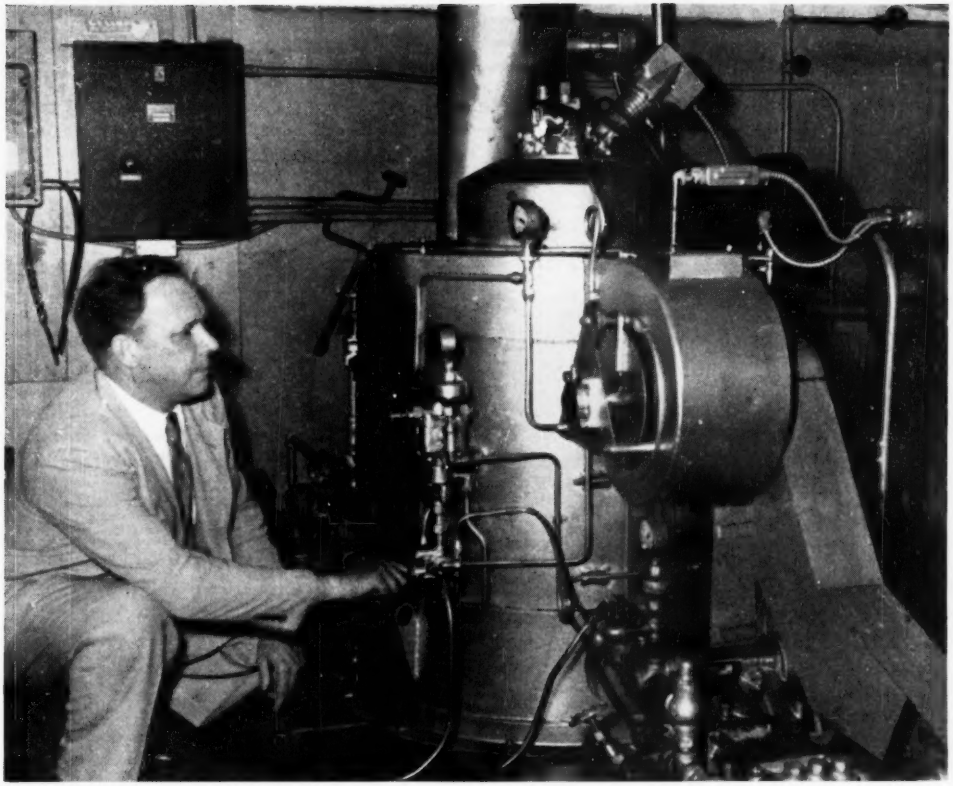
Specify Century motors for all your electric power needs.

632

Century C MOTORS

CENTURY ELECTRIC COMPANY 1806 Pine Street • St. Louis 3, Missouri

Offices and Stock Points in Principal Cities



THIS COMPACT generator automatically supplies 1,000 lb. of steam an hour—which quickly heats water in special sea clam-dipping tank. Clams immersed in 150-deg. F. water relax their muscles, and thus subsequent shucking is speeded.

"Package" Steam Generator Raises Seafood Output

Unit Also Seen Aiding Small Plants Making Other Foods

Long Island plant's "junior" installation heats clam-dip tank . . . Warmed bivalves are shucked faster, and production climbs to 1,000 bu. daily

ADOPTION of a brand-new "package" steam generator for heating water in a dipping tank has enabled the Long Island Sea Clam Co., Point Lookout, N. Y., to process 1,000 bu. of sea clams (hard clams or quahogs) per day.

This Vapor-Clarkson generator (developed by Vapor Heating Corp., Chicago) furnishes 1,000 lb. of steam an hour—enough to keep the temperature of the water in a 6x6x6-ft. clam-dipping tank between 150-160 deg. F. ■ **Accordingly, steam generation can now be employed, practically and economically, in any small operation: In plants processing other meats as well as those preparing bivalves—and in those turning out such other varied foods as canned fruits and vegetables, jellies, confections, beverages, and dairy products.**

Purpose of dipping the clams in 150-deg.-F. water is to make them gape, thus facilitating the shucking operations—opening the shells and removing the meats. Warm-water dipping does another thing: It improves the flavor and color of the clam meats.

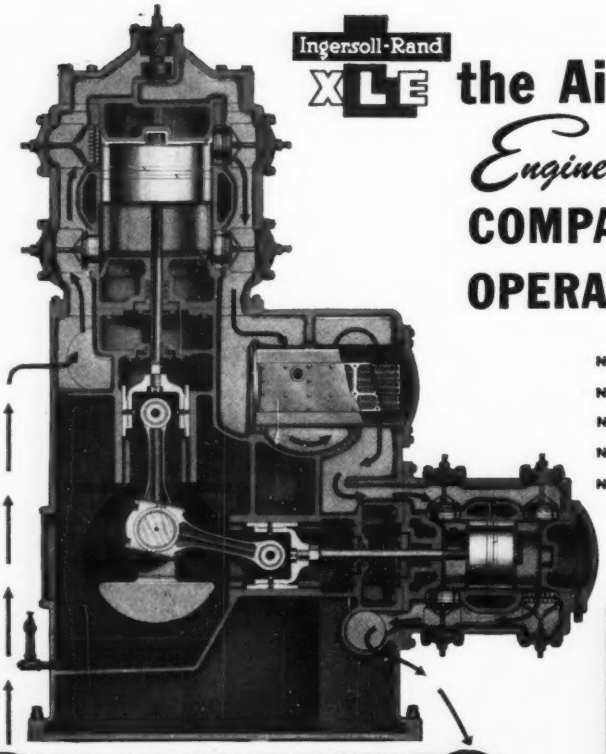
The full working steam pressure is

Ingersoll-Rand

XLE the Air Compressor

Engineered for

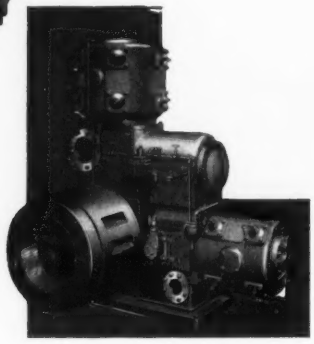
COMPACTNESS AND OPERATING ECONOMY



NEW *Air Flow* DESIGN
NEW *Intercooler* DESIGN
NEW *Cylinder* DESIGN
NEW *Frame and Running Gear* DESIGN
NEW L DESIGN

PIPELESS THRU-FRAME AIR FLOW

Main air connections on the compressor frame eliminate piping strain from the cylinders. Air flow between these two points is entirely within the frame and cylinders. There is no interstage piping. The streamlined frame houses the intercooler and combined with the wide-flanged cylinders provides a sturdy construction that maintains alignment.



Packaged design for minimum floor space, and specially balanced for minimum foundation . . . ideal for skid-mounting.

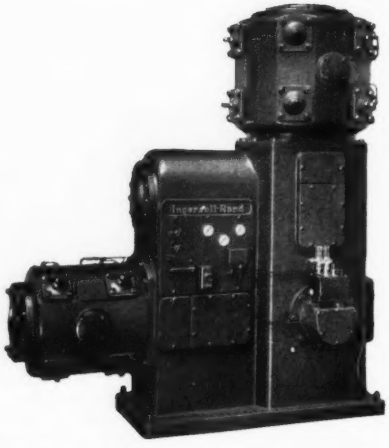
Easy to operate . . . push button starting, grouped controls, automatic force-feed lubrication, automatic condensate removal, automatic air-operated starting unloaders and capacity control.

Easy to install or relocate . . . ready-to-run, assembled shipment . . . simplified air and water piping.

Easy to maintain . . . simplified long-life construction . . . full-floating, cool-running, aluminum-alloy bearings that require no adjustment . . . no need to open the sealed crankcase which stays clean inside . . . streamlined exterior also easy to keep clean.

Low operating costs . . . new high-efficiency, long-life I-R Channel Valves result in compressor efficiency comparable to the largest units . . . durable, high-efficiency tube-and-fin intercooler saves water . . . efficient direct-connected motor.

Built for reliable, continuous full-load service . . . sizes 125, 150, 200, 250, 300, 350 horsepower . . . discharge pressures 80 to 125-psi, two stage . . . write for more information today.



Ingersoll-Rand

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ROCK DRILLS • AIR & ELECTRIC TOOLS • OIL & GAS ENGINES • PUMPS • YURBO BLOWERS

quickly developed by the package generator. It is reported to "come up" in but 1½ min. from a cold start in the morning, and in only seconds when the unit cycles off and on during the day. It is further stated that the machine operates at a thermal efficiency of 80-plus percent, burning about 50 gal. of fuel oil per working day to process 1,000 bu. of clams. Once started, automatic controls take over and the unit then generates steam only when needed.

Thermostats in the hot-dip tank are set to turn on the generator when the temperature of the water falls below 150 deg. F. Then, when steam is needed, a thermostat automatically lights the oil fire and steam is directed to the dipping tank.

The sea clam processor cites three points in favor of the generator:

■ **No special building is needed to house it.**

■ **There is no requirement for construction of an expensive smoke stack.**

■ **Danger of explosions is avoided, since there is no reservoir of water heated under pressure.**

How safety is "built in" is brought out in the following description of the unit's operation:

When the generator is started, a sparkplug ignites atomized oil. Hot gases from the resultant fire heat water, which is pumped through 300 ft. of steel coil and generated into steam.

Among the units anti-hazard devices is one that automatically turns off the generator if either steam pressure or stack temperature is too high. Another device, an electric eye, actuates a relay if the oil flame goes out or the fuel does not ignite. In turn, this relay closes a solinoid valve, shutting off the oil-feed line running to the burners of the unit.

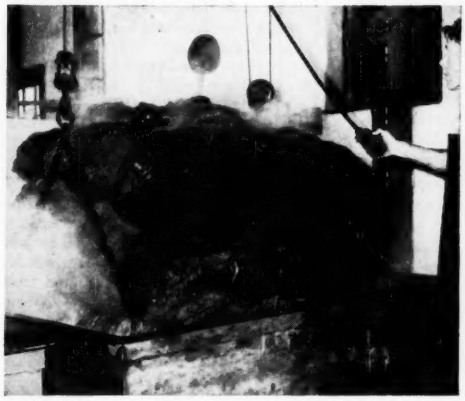
Brief of the Clam Operation

Processing of clams is carried out at the Long Island Sea Clam Co. in this manner: Using an electric hoist, a pallet load of 25 sacks of sea clams (1 bu. to the sack) is lowered into the 150-deg. F. water. And after 1 min., clams are hoist-raised and moved by monorail to another tank, and hoist-lowered into a cold-rinse tank.

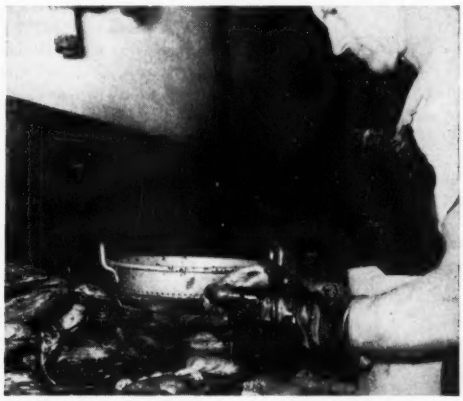
The clams' muscles are now relaxed and the shells are slightly ajar. Men next open up the clams with a knife, then cut out the meats and load them into small, perforated metal baskets to drain off the liquor.

Cleaning of the meats comes next. They are placed in washing and blowing tanks, each of which is made of corrosion-resistant metal, measures about 2 ft. in diam., and has a conical-shaped bottom, with a valve at the lowest point for draining the water.

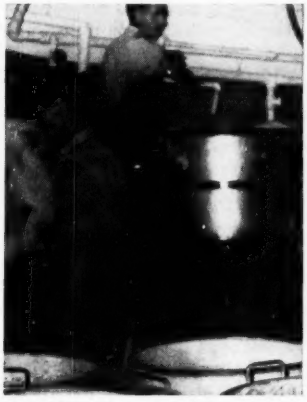
Step-by-Step Processing of Sea Clams



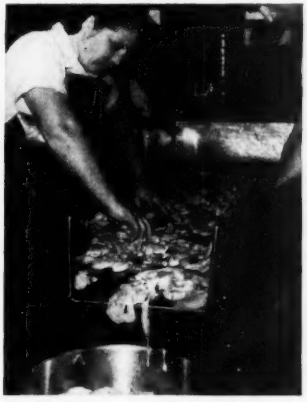
HOIST lifts 24-bu. load of clams from dipping tank. They then go in adjacent cold-rinse tank (left).



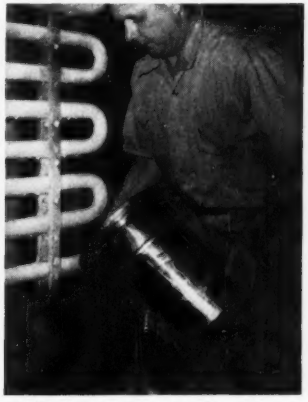
USING KNIFE, shucker opens clams, then cuts out the meats and places them in colander (rear).



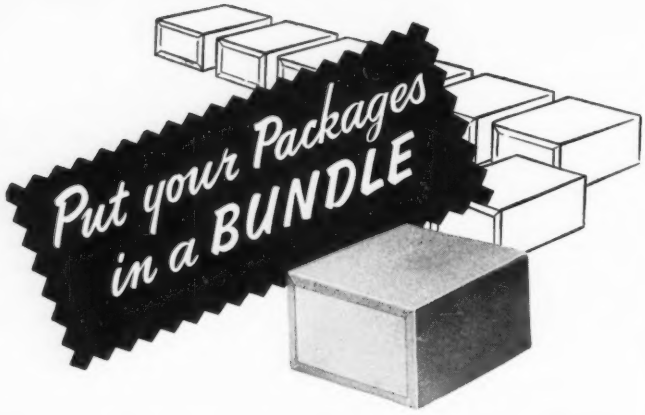
MEATS are cleaned in these washing and blowing tanks. Air gives agitation.



ON THIS tray, meats are inspected, then packed into 6-gal. tins.



CANS of washed meats go in 32-deg. F. cooler before shipping.



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With one of our machines you can bundle a dozen, half dozen or fewer cartons at speeds that show a large saving over hand packing. Equally large are the savings you make on material costs—because you use economical kraft paper in roll form instead of costly boxes.

The machine can be equipped with an assembling unit, fed by conveyor from the cartoning or wrapping machines. This unit assembles the packages in the desired manner—one layer, two or three layers—and feeds the assembled group into the machine. You have a completely automatic line that requires the minimum of personal supervision.

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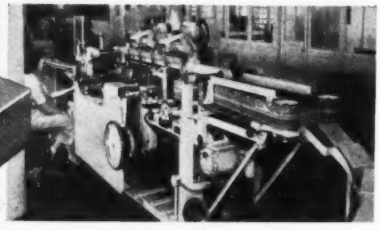

One of our Model F-6 machines bundling Ipana Tooth Paste in the plant of Bristol-Myers Co.

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Over a Half Billion Packages per day are wrapped on our Machines

Also, each tank is provided with a removable, waste-collecting false bottom. Below this, a perforated pipe enters.

Thorough Cleaning

For about 3 min. there is forceful agitation of water and meats by air forced through the pipe, thoroughly cleaning the clams. Sand and shell pieces are removed, and appearance of the meats is enhanced.

After washing, the meats are inspected on a special stainless steel tray having a perforated bottom to permit drainage of excess water. Inspectors remove off-color meats and any remaining bits of sand or shell particles. Then the product is loaded into another stainless container for further washing. There follows a re-checking, and then comes final packing in 6-gal. tins.

Cans of clam meats are placed in a 32-deg.-F. cooler, ready for shipment in refrigerated trucks to the F. H. Snow Canning Co. plant in Pine Point, Me., where the clams are used to make canned chowder.

End

Bright Can Palletizing

—Continued from page 76

A sheet of kraft paper is placed on the top of each tier of cans as it is deposited on the pallet. Primary purpose is to bind the tiers together. However, the paper also absorbs fluid from leakers that may be present, thus protecting other cans from spoilage and facilitating detection and subsequent removal of the leakers.

De-Palletizing Details

In the de-palletizer, cans are removed from pallets by a suction head similar in design to the head of the previously described palletizer, and deposited on a belt that feeds a converger.

The unit goes into action when palletized bright cans are brought by lift truck from the warehouse for labeling and packing. Cans are unloaded onto the belt—a full tier at a time—then swept into a 48-in. Standard-Knapp disk conveyor, from which they emerge in a single file for labeling.

Can sizes handled at Hawaiian Canneries range from No. 1 flat (20 tiers to the pallet, 108 cans to the tier) to No. 10's (stored 6 tiers high, 35 cans to the tier).

The company is operating 13 palletizers and 4 de-palletizers. It reports that the units have not only reduced labor costs—one unskilled operator now handles each unit—but have also brought about more efficient use of

warehouse space. It is reported, too, that maintenance of the equipment is almost negligible.

Hawaiian Canneries has granted exclusive license rights to manufacture, sell, and service the equipment in the U. S. and foreign countries, to Standard-Knapp Division of Emhart Mfg. Co., Portland, Conn.

End (*Resume reading on page* 77)

Fruit-Waste Recovery

—*Continued from page* 83

Following careful consideration of the reports (published[7, 8]) of the pilot plant studies during the 1949 season, the lime treatment of pear-cannery waste was re-examined on a laboratory scale, using waste which had been preserved by freezing. Enzymatic deesterification of the pectin in the waste proved to be more controllable than alkaline deesterification from the standpoint of subsequent juice separation.

The enzyme pectinesterase occurs naturally in pear waste, and it rapidly deesterifies the pectin if a proper environment is provided—pH 7 to 9 (preferably about 8.5 initially) and temperature 70-100 deg. F. Addition of lime to the waste not only provides a suitable pH, but the calcium ion catalyzes the deesterification reaction and combines with the pectic acid to form a gel which synerizes readily. A second addition of lime and heating of the waste further condition the material for dejuicing.

While the waste treatment studies were in progress, attention was given to the development of a device which would separate free juice from pear waste continuously without disturbing or destroying the structure of the filter cake. The first model of the dejuicing device (see Fig. 1) was constructed of wood. It comprised two filter-surface-faced drums, designed to turn together from the top, and provided with a cover into which treated waste is pumped under low pressure.

Juice runs through the filter surfaces and is collected from the interiors of the drums. Cake is deposited on the filter surfaces. As the drums turn, the two filter cakes are pressed together, and a dejuiced cake is discharged from between the drums.

This original model provided the information necessary to proceed with the design and construction of the commercial-size dejuicing press (Fig. 2) having drums that are 4 ft. long and of 4 ft. dia.

The improved treating process and the new-type, continuous dejuicing press were studied on a pilot-plant scale during the 1950 pear season. Both developments proved to be sound. The two-stage lime treatment was highly effective on all wastes encountered during the season, and substantially more effective in conditioning the waste for dejuicing than the treatment used during the 1949 season.

Batch Trouble

However, further problems became apparent: The gel structure in the treated waste was seriously damaged by agitators in the batchwise treating tanks and also by the pumping and handling of the waste after treatment,

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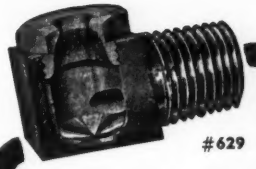

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giving rise to fine, pulpy materials which interfered with rapid dejuicing.

The dejuicing press performed its intended function effectively. Although developed for preliminary dejuicing only, this press, when fed with waste treated by the improved process, produced a cake which was easily dried in a direct-fired rotary dryer without further treatment. The problem of continuously separating waste into two fractions was thus solved. Need was seen, however, for improved waste-treating equipment that would provide optimum conditions at all stages in the treatment of the waste in order to take full advantage of the process developments.

Private Firm Takes Over

Late word is received that the waste utilization plant described here has been taken over by a new privately financed concern, Pacific Biochemical Co., for a reported purchase price of $200,000.

The new owners intend to install more than $75,000 worth of new equipment.

Heading PBC is James G. Macy, until recently associated with Western Condensing Co., while Hugh J. Jacks, member of McAndrew & Co., investment dealers, is chairman of the board. Among the directors is Robert D. Stuart of the Quaker Oats Co.

Following the 1950 pilot-plant season, study was directed toward development of a continuous system for treating the pear cannery waste. Here, the initial treater was developed through laboratory and prepilot-plant studies, and its operation yielded design data for the plant-size unit (see lead photo). The small treater had given a capacity of approximately 400 lb. of waste an hour, while capacity of the plant-size unit was over 6 tons an hour.

The continuous treater was forthwith installed in the pear-waste utilization pilot plant, and it operated at its rated capacity throughout the 1951 pear season.

Up 50 Percent

Effectiveness of the improved waste treatment combined with the continuous treater was clearly demonstrated by the fact that the waste-handling capacity of the dejuicing press was increased at least 50 percent over that of the previous year.

In all, more than 1,800 tons of pear cannery waste were processed to molasses and pulp during the 1951 season, and the products were readily sold for feed use.

Feeding tests with cattle and sheep, using pear pomace and pear molasses from this plant, have been reported[9]—revealing that both feeds are highly palatable and produce satisfactory gains.

Three Major Factors

This development of a complete process, tailored to the needs of a specific situation, was accomplished only through a coordinated effort involving cooperation of industry and a government research team. The success of the final process depends on these three major developments:

(1) An inexpensive, effective chemical treatment to condition pear waste for ready separation of juice from pomace; (2) a continuous treating system to apply the chemical treatment; and (3) a new type of dejuicing press to handle the treated material.

Thus, given reasonable prices for feed materials, pear cannery waste may now be profitably utilized for the production of stock feeds.

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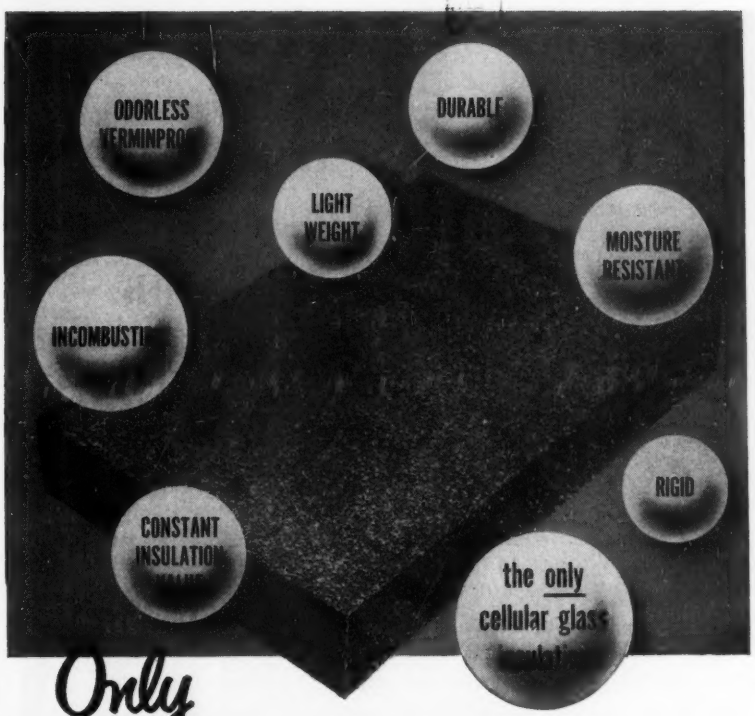
9. H. R. Guilbert and W. C. Weir, *California Agriculture*, 5, 11, p. 6, 1951.

Acknowledgements are made to industry groups and personnel contributing to the pear waste project, including: The Canners League of California; the Cling Pear Advisory Board; the Santa Clara County Canners Assn.; a technical waste-disposal committee (members drawn from the League and the Association) under the chairmanship of A. C. Richardson; and Superintendent W. E. Hotchkiss of the experimental plant.

Technical personnel from the Western Regional Research Laboratory participating in the development, in addition to the authors, include: W. D. Maclay, H. S. Owens, J. H. Thompson, G. H. Neel, N. Fishman, G. G. Purvis, J. Guggolz, and G. R. Van Atta.

Photos used in this article and in the FE Picture-flowsheet (pages 136-139) were taken by Jay Allison (of the Western Regional Research Laboratory) and A. C. Richardson (of the California Packing Corp.).

End (Resume reading on page 84)



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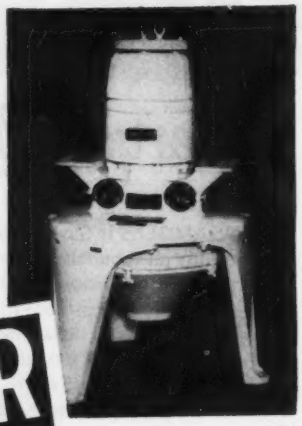

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Big Beverage Success

—*Continued from page* 102

now are favored. Two are company-designed, with capacities of 48 and 96 bottles. The other is a 240-bottle "Vendolator." All are "exclusive" machines of attractive design. Further, they are operated at controlled temperature several degrees below that normally associated with other drinks. This provides a distinctive "frosty" or near-frozen condition.

Selling Not Coercion

Setting the sales psychology and operating procedure for over 400 independently owned franchised bottling plants is a challenging job.

To get these many bottlers to operate as a team, Dr. Pepper sells its ideas with a high degree of enthusiasm tempered by tact. Says W. W. Clements, vice-president in charge of sales: "This is like selling 4,000 men the idea of putting a harness on themselves, and then letting them feel that they have the reins."

To aid Clements, who spends half his time circulating about the country, there are two divisional sales managers, with the Mississippi as their dividing line. And there are 12 Dr. Pepper zone managers, each residing in his territory, who are the actual everyday contact between company and bottlers.

Zone managers, being key men, are extremely well trained at headquarters in company policies, merchandising technics, and even vending machine upkeep. These men hold periodic sales meetings in each plant and are relied on to explain any changes in policy or new merchandising approaches.

Working parallel to the zone managers are seven quality-control fieldmen operating in as many territories throughout the country. These men are production specialists as well as technicians, and they are available "on call" to assist any bottler with his technical problems. Periodic inspections are carried out by this field staff to provide a continuous check on the operating standards of each franchise and the quality of its beverage.

Extensive training facilities and planned sales meetings for managers and owners of the bottling plants also play roles in the Dr. Pepper activities. All bottlers can send men to Dallas for an intensive course in either production or sales. Further, all-day sales meetings—complete with lively props—are held in key cities over the country to periodically acquaint bottlers and their salesmen with new promotions and campaigns. More than a score of such meetings are held annually, attended by 2,500 salesmen.

Most tangible evidence of Dr. Pepper progress is the new functionally designed syrup plant and headquarters building located on a landscaped 26-acre site in an outlying section of Dallas.

Main building of the two-structure group is four stories high and houses the syrup manufacturing operations, a local bottling plant, and the executive and general offices of the company. A one-story building adjacent provides offices for local sales, advertising, and cooler and vendor departments, plus sizable garage space.

The top floor of the main building is air conditioned and entirely devoted to headquarters activities. It contains the offices, an employees' lounge, display and meeting rooms, and the directors' room.

Below the office floor is an area that can store 35,000 sacks (100-lb. each) of granulated sugar for the syrup manufacturing department. This sugar is gravity-fed, through hoppers adjacent to the storage area, to the syrup mixing tanks on the floor below. Adjacent to the sugar feed-in area is the balcony of the compounding laboratory and the controlled-temperature vaults which store the various flavoring ingredients.

On the mixing floor are also located storage space for various ingredients, the control laboratory, and a bottling room.

The Dallas bottling plant, which is integrated in the building, covers a floor area of 4,000 sq. ft. Being available to headquarters scrutiny, this operation serves as both a model plant and proving ground for the organization.

End (*Resume reading on page* 103)

Churned Margarine

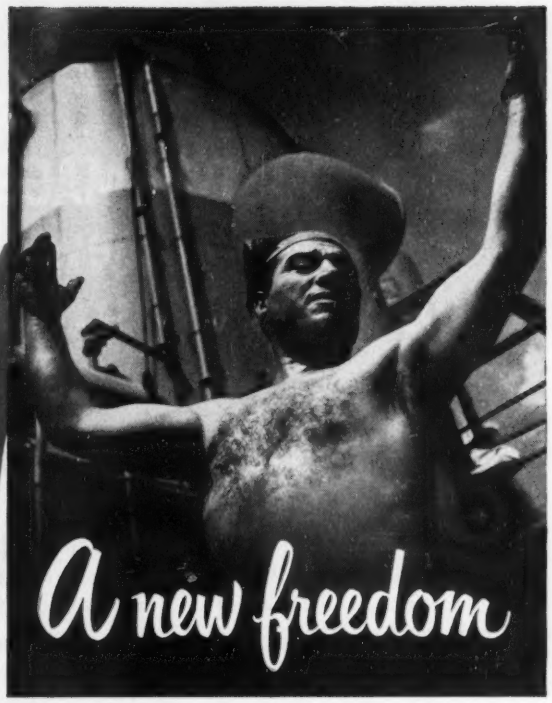
—*Continued from page* 114

is removed. At this point the moisture content of the product is from 13 to 14 percent—about the same range as in butter granules at the same stage in churning. Further, the curd, or milk-solids-not-fat content averages about 0.8 to 1.0 percent, which is in the same range as butter.

After removal of excess skim milk, the granules are washed with cold water to prepare them for further working. Then this water is drained off, salt is added if desired, and the mass further worked in the same manner as butter.

When the working is completed, the margarine is removed from the churn and packed in boxes or on trucks and held for further cutting and wrapping into consumer packages. Or, it may be printed immediately, using automatic equipment. Once again, these

Across the face of the World a new Freedom spreads . . . like a strong man's smile . . . a Freedom from heavy burdens . . . a Freedom from beastly toil . . . a Freedom from useless costs . . . a Freedom from waste and spoil . . . It is a Freedom brought by Machines . . . and by Methods created by Men who engineer history for the greatest good of their Kind.



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Operates on all cans, 6 oz. to No. 2½ tins. Simple side mounted lever adjusts in two minutes.

Model 400 Dudley Can Unscrambler has 4 lanes; these lanes can be varied to exactly match capacity requirements of any large run.

Model 100 has single lane, for use on smaller capacity runs. Cooker capacity is doubled* with this unit alone, because canner handles jumbled cans in double layers.

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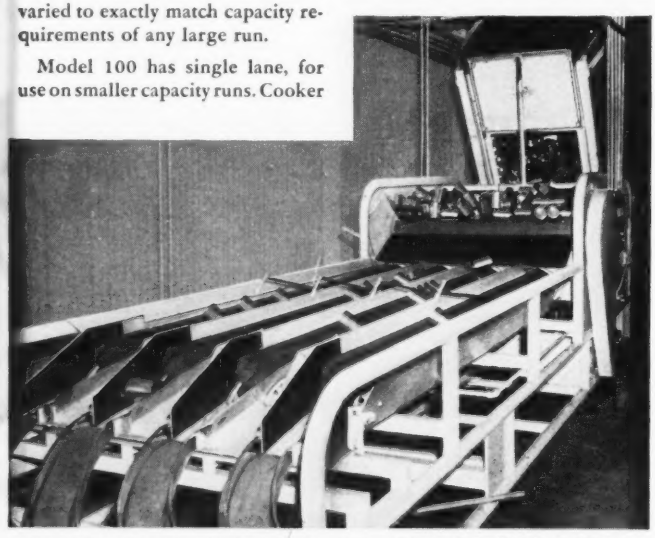

Photo Showing Dudley Model 400 Can Unscrambler with Dudley Basket Dumper

DUDLEY *Machinery Corporation*

Mountain View, California

stages merely duplicate procedures followed in any butter plant.

In-Plant Operation

Commercial production of Cloverbloom 99 was launched in Fort Worth, Tex., in a completely new plant of Collier Industries, an Armour affiliate.

All processing equipment is made of stainless steel. Even the tanks which truck or rail-deliver oil to the plant are fabricated of this metal, object being to minimize oil deterioration during transit.

A Moyno pump unloads incoming oil to four 60,000-gal. stainless storage tanks—fabricated by Kaplan Metal—which are held in a temperature-controlled room. The pump is unique in its ability to handle partially congealed and plastic material in sanitary fashion. It works on a screw principle, with a single helical moving part as a rotor.

In quest of better quality, the company is utilizing fats and oils with lower and lower melting points. Armour feels that this will be more feasible when margarine distributors make a point of keeping the product under refrigeration. The company has stressed refrigeration "from the word go"—because it contends that margarine *must* receive the same special care given butter, if the delicate flavor is to be protected.

Milk for the process is pasteurized in 1,000-gal. General Dairy Oval-Coil vats at 165 deg. F. for 20 min. It is then pumped into two sequence-operated 550-gal. Alloy Product heating and mixing vats. Here, a sanitary pipe manifold, extending down from the oil tanks on the floor above, allows direct selection and proportioning to form the desired oil-milk mixture.

Steam-Vacuum Treatment

The unstable mixture is pumped to a high-temperature pasteurizer, where it is heated to 250 deg. F. by jets of live steam. Pressure within the inlet pipe is maintained by means of a spring-loaded back pressure valve set at 15 psi. Upon release to the vacuum chamber, the product explodes in a fine mist and is cooled by evaporation to 138 deg. F.

From the pasteurizer, the product, now an emulsion, is pumped rapidly to a Mojonnier sweetwater-chilled surface cooler, where temperature is dropped to approximately 46 deg. F. At this point, visual inspection shows that the fat displays no tendency to clump or grain out and appears to have all the physical characteristics of churning cream.

Four Creamery Package 1,000-gal. horizontal coil vats next receive the product. They act as surge and tempering vessels between the continuous

steam-vacuum treatment and churning, in addition to further stabilizing the temperature of the product.

The emulsion is then pumped into a 2,500-lb. Vane churn—there are four—where vitamin A and color are added, and the churn set in motion. First evidence of the formation of granules comes after about 30 min. Then, 15 min. later these particles become pea sized, at which time the skim milk is drained and cold water added to the granules and left for 10 min.

When the water is removed, salt is added to the granules at a rate of about 2½ percent of the finished batch. Starter distillate is also added for flavor. Then the churn is set in motion and the margarine worked to the desired body and texture in about 12 min.

From the churn, the plastic mass is transferred to a wooden platform truck, weighed on a Fairbanks platform scale, then wheeled into a thermostatically controlled, 60-deg.-F. tempering room. Here, the margarine is held for a few hours. Then comes packaging.

Conversion to 1-lb. packages of four individually wrapped bars is via Lynch Morpak Model T units. In addition, there is a line turning out the special ½-lb. wax-paper-wrapped patties. In operation, too, is a line providing the individual-portion patties—triangular in form and sold under the trade-mark "Margarette."

Progress Has Been Good

In both consumer acceptance of Cloverbloom 99 and process efficiency, progress has been gratifying. The product was first test-marketed early in 1950 in a few southwestern communities at a price about 2c. above first-grade conventional margarine. Since then, the new spread has become firmly entrenched in the far-flung southwest area. And today it is being moved cautiously, but with every sign of success, into national distribution.

Naturally, special aspects of the new process added a cost somewhat out of proportion to the modest price-upgrading assigned to the product. Over the past two years, however, intensive effort by Mr. Turgasen and his associates has reduced manufacturing costs more than 50 percent.

A major factor in the increasing efficiency at the Fort Worth plant is the positive quality control system—a routine that has cut "off-processed" batches to zero. Each churn number has 49 pertinent process factors recorded—including temperatures, times, weights, and laboratory readings. This record follows the product from the oil tank, through shelf-life tests, and into the final shipping container.

End (*Resume reading on page* 114)

....in food processing
Sparkler Filters
share your responsibility
Exploded view of filter plate showing how easily all parts may be disassembled for quick, thorough cleaning.
Plates are nested together in series and are held together by easily accessible tie-rods.
When cleaning is indicated the entire assembly can be removed from the filter tank to the most convenient cleaning station with minimum effort and labor.

When processing any type of food product, there are certain standards of purity and sanitation that must be met both in the public interest and in the interests of maintaining the manufacturer's reputation.

Sparkler filters *are* designed to help do that job . . . simply and positively.

The illustrations show why Sparkler filters are completely sanitary. They also show how the horizontal plate is used. It is this horizontal plate feature that assures unsurpassed quality and *constant* quality of filtrate. With a Sparkler filter on the job, the entire filtration process becomes one step in your operation that *you can count on.*

Write Mr. Eric Anderson for full information.

SPARKLER MANUFACTURING COMPANY

MUNDELEIN, ILLINOIS

Sparkler International Corp.
Herengracht 568, Amsterdam, Holland

Sparkler Western Hemisphere Corp.
Mundelein, Ill., U.S.A.

Manufacturers of fine filtration equipment for more than a quarter of a century.

NEW PACKAGES & PRODUCTS

Food for Young Fry Becomes a Major Commodity

With shipments totaling 106,208,000 dozen cans of baby and junior foods during the first 10 months of 1951, it is evident that sales of these items are no longer in the luxury or specialty class.

A survey of self-service stores and supermarkets shows that an average of 150 to 200 different items are carried regularly on their shelves. These foods cover vegetables, fruits, meat, fish, custards, puddings, and soups.

In addition to national coverage, export of these foods is growing steadily.

Major processors of these foods include Libby, McNeill & Libby, Chicago; Clapp's Baby Foods Div., American Home Foods, Inc., New York City; H. J. Heinz Co., Pittsburgh; Swift & Co., Chicago; Van Camp Sea Food Co., Terminal Island, Calif.; Beech-Nut Packing Co., Canajoharie, N. Y.; Bib Corp., Lakeland, Fla.; Gerber Products Co., Fremont, Mich.; Armour and Company, Chicago, who pack for Gerbers; and Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass., who distribute through Beech-Nut.

New Items Being Introduced Regularly

The last year has seen many new infant foods being developed. Processors are not only bringing out foods to make it easier for mothers to get their offspring to eat, but considerable attention is also being paid to processing foods that are rich in vitamins, minerals, and other food values necessary and nutritional to the growing child.

Packaging of these foods follow, more or less a uniform pattern—with the strained and chopped foods being put up in either 3½ and 4¾ oz. cans or in 5 and 8¼ oz. glass jars, while the precooked cereals are packaged in 8 oz. chipboard cartons.

Among the latest in this line of ever increasing items are the following:

Strained liver and bacon for babies and chopped liver and bacon for juniors, packed in 3½ oz. cans.—Swift & Co., Chicago.

A 5-oz. glass jar of strained bananas.—Beech-Nut Packing Co., Canajoharie, N. Y., with jars and closures by Anchor Hocking Corp., Lancaster, Ohio, and labels by Stecher-Traung Litho Corp., Rochester, N. Y.

Ready-to-serve rice cereal in an 8 oz. carton.—Gerber Products Co., Fremont, Mich. Here, wrap is supplied and printed by U. S. Printing & Lithographing Co., Chicago.

Strained beef hearts, lamb, pork for babies, and chopped pork for juniors in 3½ oz. cans.—Packed by Armour and Company, Chicago, for Gerber Products Co., Fremont, Mich., with cans by Continental Can Co., New York City, and labels by McGill & Weinsheimer Co., Chicago.

Strained pears for babies in 5 oz. glass jars, and butterscotch pudding, custard pudding, and a macaroni, tomato, beef and bacon combination for children in 8¼ oz. glass jars. Also, a pre-cooked barley cereal in 8 oz. cartons.—H. J. Heinz Co., Pittsburgh. Closure: White Cap Co., Chicago.

Strained tuna, under "Chicken of the Sea" trade-mark, in 3½ oz. cans.—Van Camp Sea Food Co., Terminal Island, Calif.

Strained codfish in 3½ oz. cans.—Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass. Distributed by Beech-Nut Packing Co., Canajoharie, N. Y.

Orange juice in 4 oz. cans.—Bib Corp., Lakeland, Fla.

Banana pudding in 4¾ oz. glass jars and also in 3½ oz. cans.—Libby, McNeill & Libby, Chicago. Closure: White Cap Co., Chicago.

Strained pear and pineapple combination, strained sweet potatoes in 4¾ oz. glass jars and junior sweet potatoes in 7¾ oz. glass jars.—Clapp's Baby Food Div., American Home Foods, Inc., New York City. Closures: White Cap Co., Chicago.

For More Data on Package Supplies Named Use Reader Service Card

Do customers

NEGLECT

or

SELECT

your package?

Packages with plain caps are often overlooked in today's busy market. But a bright, colorful cap makes your product stand out on dealers' shelves . . . wins buying attention . . . closes sales.

An Armstrong-designed cap keeps on working for you even after the sale has been made. Every time your package is opened or closed in the home, it repeats your sales message, slogan, or brand name—builds profitable repeat business.

Consumers prefer these practical caps for still another reason. An Armstrong cap is so easy to use. There's no need for gadgets to open it, no fumbling to close it again. The seal is always tight and sanitary, the contents stay fresh and flavorful.

Test the buy-appeal of an Armstrong cap on your package—your sales will show you it's a smart idea. Get complete information and prices today. Just contact your Armstrong packaging representative or write direct to Armstrong Cork Company, Glass and Closure Division, 8502 Prince Street, Lancaster, Pennsylvania.

Western Representative: I. F. Schnier Co., Inc.
San Francisco 7 and Los Angeles 12

An Armstrong Cap

Armstrong's Metal Caps

Packaging Headquarters for Armstrong's Glass Containers, Embossed-Top Corks, Crowns, Artmold Plastic Caps, and Du Pont "Cel-O-Seal" Bands

"Just Sign on the Line"

"Just sign there and you'll get a check on the 10th of each month. These payments should teach your employer a lesson he deserves. He could have prevented your accident if he had installed safety floor matting in front of that machine."

Do-All
RUBBER & CORD MATTING

not only affords safety underfoot but also serves as an ideal comfort mat.
Hugs the floor. Beveled edges. Comes in rolls of 20' 5" long, comprised of 35" x 35" units of four 17-inch square sections. Easily cut to cover desired area. Four mottled colors: Venetian Red, Erin Green, Delft Blue and Mosaic.

SEND COUPON FOR LITERATURE AND PRICES

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1797 Adams Street Toledo 2, Ohio
Please send literature and prices on Do-All Matting.
NAME.....
FIRM.....
STREET.....
CITY & STATE.....

IN CANADA: American Mat Corp. Ltd., Canada Trust Bldg., Windsor, Ontario

Cookie Line Introduced In Foil Wrap

Four new cookie items, packaged in aluminum foil, are being marketed by Weston Biscuit Co., Passaic, N. J.

The company not only cites the high protection of the wrap but also its attractive and distinctive design promoting excellent eye-appeal.

The four varieties are chocolate pecan, using choice chocolate and nuts; coconut macaroons, with pure shredded Philippine coconut; lemon wafers, made with pure lemon juice; and orange wafers, made with pure orange juice.

These cookies are placed in two rows, with a divider of fluted parchment between the rows. And there is a liner of the parchment around the entire contents. These units are packed in a chipboard box and overwrapped with bright multi-colored foil.

The orange and lemon wafer packages were designed by Reynolds Metals Co., Richmond, Va., who supplies the foil. Benj. C. Betner Co., Devon, Pa., designed and supply the foil for the chocolate pecan and coconut macaroon cartons.

To Get More Data on Supplies Named Use the Handy Reader Service Card

"Chicken-in-the-Rough"

Long a popular item on the bill-of-fare, "chicken-in-the-rough" is now available in frozen form through Virginia Affiliates, Inc., Richmond, Va.

Packed in a waxed, chipboard carton, the contents include 8 oz. of fried chicken, a 2-oz. honey roll, 1 oz. of potato sticks, salt, and a napkin. Carton has an inner waxpaper liner, in which are packed the pieces of breaded chicken, the roll, and the potatoes enclosed in a cellophane bag. On top of the pack is the napkin and a small, heat-sealed packet of salt.

The contents can either be thawed and eaten cold or served hot by merely heating frozen contents in a hot oven.

Package design by Beverly Osborne, Oklahoma City, Okla.

To Get More Data on Package Design Use the Handy Reader Service Card

Norwegian Whale Steak

Taken from the frigid waters of Norway, whale steak is quickly processed, frozen, and packed in the modern plant of the Hitra Canning Co., Hitra,

Norway—and it is now being introduced in this country by Norse Foods, Inc., New York City.

Called "The Venison of the Sea", and bearing the brand name of "Capt. Seth's", the steak is packaged in a 1-lb. chipboard carton and carries a colorful illustrated label showing a hardy sea captain and ship's steering wheel, reminiscent of old sailing days.

The product has the appearance and texture of beef tenderloin and is prepared in the same manner.

Carrot Bag Is Neat-Plus

Increased demand for prepackaged produce is resulting not only in packages that protect and make it easier for the consumer to select them in self-service stores but also in sales-stimulating wraps.

To secure an attractive closure for a fresh carrot package, Maggio Bros. Co., Los Angeles and El Centro, Calif., working with Shellmar Products Corp., Mount Vernon, Ohio, came up with a specially designed Pliofilm bag.

Across the top is a wide green band with irregularly serrated edges. And when a "Twisteem" band is tightened around it for closure, this band resembles fresh, bright carrot tops.

At a glance, the package presents three bands of color—the green at the top, the bright orange of the washed and graded carrots showing through the film at the center, and a wide, deep blue band at the bottom, acting as a background for the yellow and red printing.

On the front of the package, printing features the brand and product name; and on the back is illustrated the California sunshine in which the carrots were grown.

The bag is printed at the Shellmar plant in South Gate, Calif.

To Get More Data on Supplies Named Use the Handy Reader Service Card

NOW

A NEW REFLECTANCE ACCESSORY that simplifies color evaluation

Easily Installed

The attachment consists of an integrating sphere in holder and a sliding sample tray which are easily installed in place of the standard Model B sample compartment and cell carriage.

Precise Measurements

To permit utmost measurement precision, a detent mechanism operated by a convenient push button in the sample tray knob exactly reproduces forward and backward position of the sliding sample tray. The resulting precision is particularly valuable for accurate measurements on samples with rough surfaces or non-homogenous colors.

Readings taken rapidly are reproducible to at least 1%—with careful technique even greater precision is obtained.

Operating Convenience

Special provision has been made so that liquid samples can be conveniently inserted without spilling . . . powdered samples without disturbing the smoothed surface.

Sample Size

Sample size is approximately 1" x 1 1/4" with a maximum thickness of 5/16"—ample for most applications. Or, by simply rotating the sphere 180° in its holder, larger samples can easily be accommodated.

Quick, Easy Readings

Accurate color measurements are made with great speed and simplicity. First the instrument is adjusted to read 100% reflectance on a white standard (such as MgO), the sample is moved into position and the percent reflectance (compared to the standard) is then read directly from the meter. It's as simple as that—and the three-compartment sample tray permits quick comparison of two samples and a standard on each run.

To further increase the wide range versatility of the well-known Beckman Model B Spectrophotometer, a new Reflectance Accessory is now available for use on opaque, colored samples in solid, liquid or powder form. There are many useful applications for this accessory in the precise evaluation and comparison of color intensities and hues.

For example, diffuse reflectance measurements are useful for accurately controlling the whiteness of talc . . . for controlling artificial coloring of foodstuffs such as butter, catsup, and condensed milk; . . . for calculation of dye bath recipes in textile processing . . . for grading the color of paper and the whiteness of flour . . . for matching and controlling shades of powder, rouge and lipstick, paints and inks and many other products where accurate color measurements are essential.

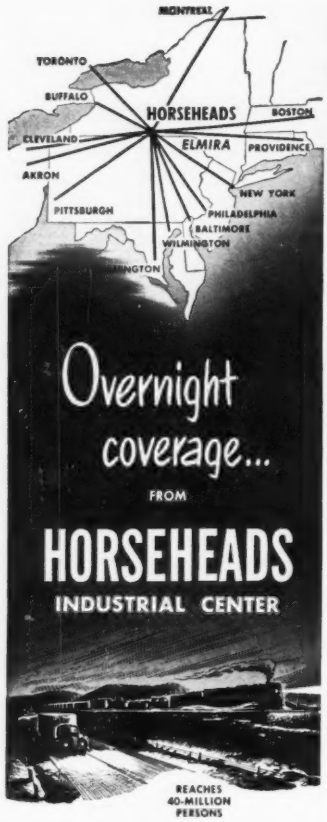
SEND FOR NEW BULLETIN

Important features of this new Reflectance Accessory are outlined at right. A bulletin describing the unit in greater detail will gladly be sent. Ask your nearest Beckman Instrument dealer for bulletin #235—or write direct.

BECKMAN
INSTRUMENTS

SOUTH PASADENA 16, CALIF.
Factory Service Branches
Chicago • New York • Los Angeles

Beckman Instruments include pH Meters and Electrodes—Spectrophotometers—Automatic Titrators—Electricity Meters—Special Instruments



New In-Transit Point East or West Offers Distribution Savings

Complete warehousing service now offered at Horseheads

- *Carloads in and out*
- *LCL consolidation*
- *Packaging, repacking*
- *Processing, bottling*

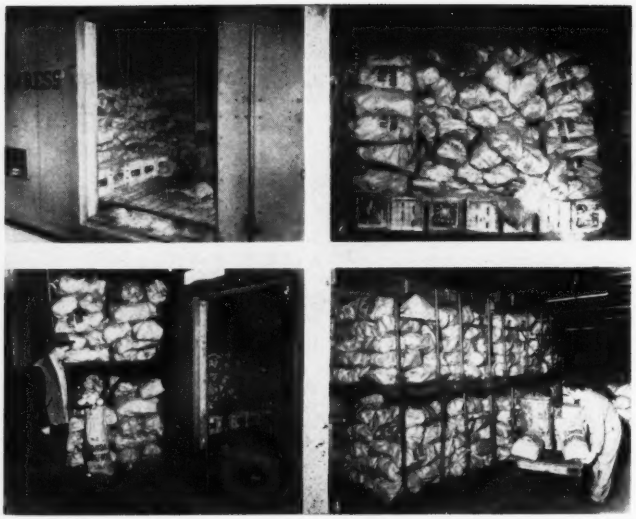
Horseheads Industrial Center is served by 30 truck lines and 4 railroads: D. L. & W., Lehigh Valley, Erie, Pennsylvania. *New construction* offered on low-rental basis, for storage, processing, assembly.

For full details, write:

LEHIGH-HORSEHEADS

WAREHOUSE CORP.

Horseheads, N. Y. or
98 Frelinghuysen Ave., Newark, N. J.



Paper Bags Supplement Boxes In Fruit Shipments

After extensive test shipments, railroads have accepted the 4/5 bu. (40 lb.) paper bags for grapefruit shipments.

This new economical method of shipping grapefruit results from the joint efforts of Union Bag & Paper Corp. and the Atlantic Commission Co., New York City. Their solution took the form of a special bag made from three layers of wet strength paper and wire tied. A series of perforations in the bag provide the necessary ventilation.

Most satisfactory use of the bags was found to be in conjunction with conventional boxes. Early season shipments, when the fruit is firm, are made by loading the cars with one layer of boxes, then a layer of straw, then the sacks (photo top left). As season moves on and the fruit becomes softer, more boxes and less bags are used.

It is estimated that this utilization of bags has saved $47 to $75 per carload. Also, savings in freight charges are figured at $13 to $16 per car.

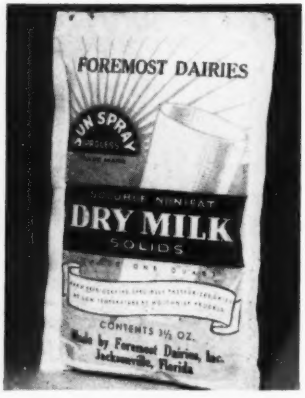
Other factors contributing to the increased use of the bags include—

Safety in Shipment. As shown in photo (top right), there is little if any, shifting in the load of bags.

Ease of Inspection. The wire-tied bags can be easily opened for inspection and retied (photo bottom left).

Storing Features. Bags lend themselves to palletizing in warehouse handling (photo bottom right).

To Get More Data on Supplies Named
Use the Handy Reader Service Card



Handy Dry Milk Solids

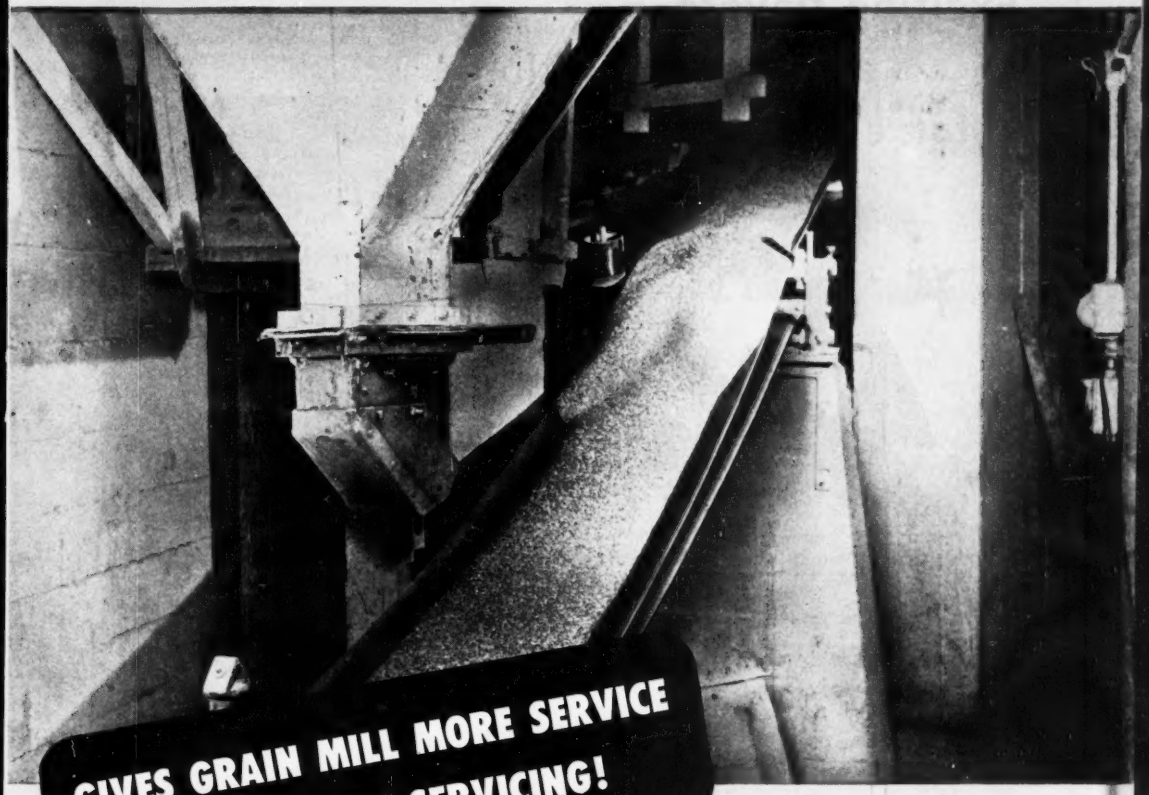
Soluble non-fat dry milk solids, rich in proteins, minerals, milk, sugar and vitamins, are being offered by Foremost Dairies, Inc., Jacksonville, Fla., under the tradename, "Sun Spray".

Product is packaged in a 3½-oz. heat-sealed, laminated foil envelope. When reconstituted it will make 1 qt. of liquid milk.

The solids are dried at low temperatures on specially designed equipment developed by Mojonnier Bros. Co., Chicago.

In addition to use as a beverage, product can be employed in its powder form where a large part of the ingredients are dry, such as in recipes for biscuits, cakes, etc. It is necessary

QUAKER *Production-eered** BELTING



GIVES GRAIN MILL MORE SERVICE ...WITH LESS SERVICING!

QUAKER CONVEYOR BELTING

HAULS 16,000,000 BUSHELS OF GRAIN . . . STILL IN ITS PRIME

Eight hours a day—every day—for 20 years! More than 16 million bushels of grain hauled! High production, high efficiency . . . low cost, low maintenance. That's the record life story to date of this rubber conveyor belt "Production-eered" by Quaker for Bewley Mills, one of the South's busiest flour and feed mills.

Wheat, corn, oats, barley, maize . . . everything unloaded from box cars goes over this belt. Yet it still shows no signs of wear or tear! Commenting on the more than 2 *miles* of Quaker Belting in steady use throughout the mill, Bewley's General Manager states: *"Experience has shown us that exceptionally long service can be expected from Quaker Belts."*

Just one more example of Quaker "Production-eering" at work. Let an experienced Quaker "Production-eer" help you boost production, cut costs — with Quaker "Production-eered" hose, belting, packing and molded rubber products.

***Production-eering**—Every Quaker Industrial Rubber Product is "Production-eered"—engineered to provide maximum life, efficiency and production on each type of installation. Quaker "Production-eers" are ready to recommend the right rubber product for the right job. For timely production tips, get the new free booklet on Production-eering for Industry. Write today.

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Exciting flavors are the foundation for exciting sales

COSMO Flavor Line

All-purpose flavors, extremely powerful . . . For high quality flavoring at very low cost.

DOLCO® 5200 Flavor Line

D&O improves on nature with these highly concentrated, top-notch imitations of natural fruit flavors available in 20 popular flavors. All color derived from the natural fruit.

DOSIX® Flavors

True fruit flavors, reinforced with other natural flavors. Particularly useful for fountain syrups, pectin jellies, cream centers, icings and ice cream.

DOLCOTT® Hard Candy Flavors

Natural extractives fortified with synthetic aromatics, especially useful where very high temperatures are employed.

MICROMUL Flavors

Especially designed for flavor manufacturers of all types of household and bottlers' flavors and concentrates.

AP-RO-PO Flavors

For the hard candy manufacturer who requires realistic flavors at low cost.

Excellent selection in all Flavor Lines. Ask for Bulletins or new Flavor Catalog.

D&O ESTABLISHED 1909

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180 Varick Street • New York 14, N. Y.

SALES OFFICES IN PRINCIPAL CITIES

ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • FLAVOR BASES • VANILLA

only to mix or sift the dry milk with the other ingredients, using water as the liquid for the recipe.

To Get More Data on Equipment Named
Use the Handy Reader Service Card

Conk From the Caribbean

Under the brand name of the He-Man Foods Co., Miami, a product called Chili Conk has been introduced by Bob White Organization, Chicago.

This is a canned shellfish food made from the white, firm muscle of the conk, a large shellfish found in the West Indies. Also included in the product are beans, tomato puree, flour and vegetable oil, onions, chili powder, salt, starch, brown sugar, spices and flavoring. Preparation is from an ancient native Caribbean recipe. Air freight is used to assure dependable and satisfactory procurement of the meat.

The 10½-oz. can carries a bold red, yellow, and black label, illustrated with a colorful pirate seated on a treasure chest. Also included are directions for serving. Label design is by Eric James, Miami.

Emphasizing the Friday and Lenten idea, the label proclaims, "Serve it *Friday* or any day."

To Get More Data on Package Design
Use the Handy Reader Service Card

Package & Product Short

Nuts in Re-Usable Glass Tumbler

A new line of processed nuts, including sliced filberts, whole and sliced blanched almonds, and sliced pecans, has been introduced by Ready Nut Co., Chicago. The nuts are packed in tapered, re-usable tumblers, sealed under vacuum with gay red and white lithographed caps. Glass and closures furnished by Anchor Hocking Glass Corp., Lancaster, O.

To Get More Data on Supplies Named
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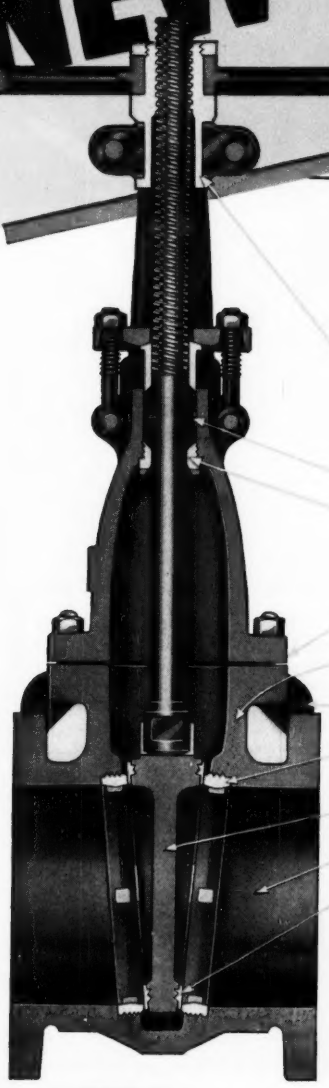
IRON VALVES that give you Steel Valve Features

NEW

OIC
FOUNDED 1883



NOW the workhorse of the family—OIC's iron valve—offers you features formerly found only in steel valves. It's a brand new valve built around more than a third of a century's experience in making iron valves. We kept only the old handwheel.

Examine these construction details:

1. Lubricated yoke bushing, renewable without removing bonnet.
2. Deeper stuffing box; longer packing life.
3. Inserted back seat bushing permits repacking under full pressure.
4. Stronger body-bonnet joint; uniform gasket compression.
5. Better metal distribution, reduced weight, increased strength.
6. Sturdy tie-ribs; added resistance to pipeline stresses.
7. End-seated bronze seat rings will not loosen in service.
8. I-Beam type solid wedge, accurately guided.
9. Straight-through port areas reduce flow resistance.
10. Rolled-in seat facings on wedges give longer life.

OIC's new line of Iron Valves gives you longer service, lower upkeep and greater security. For Bulletin 805 telling you all about them, call your local OIC distributor or write The Ohio Injector Company, Wadsworth, Ohio.

OIC
FOUNDED 1883

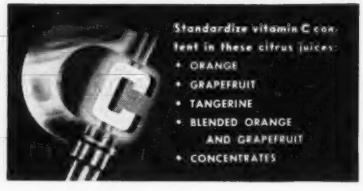
VALVES

FORGED AND CAST STEEL · IRON · BRONZE

One of a Series Dedicated to the Nutritional Advances of the Food Industries

KEEPING FAITH WITH NATURE

SUN-DRENCHED CITRUS FRUITS are endowed by Nature with substantial, but variable, quantities of ascorbic acid (vitamin C). Consumers expect to receive the same amount of vitamin C in all varieties of citrus juice, whether canned, frozen, reconstituted, or diluted in the form of orangeade, lemonade, etc. Standardize vitamin C content to offset variations resulting from soil, climate, and processing losses. Progressive packers should capitalize on consumer interest in juices of high nutritional value.



Standardize vitamin C content in these citrus juices:

- ORANGE
- GRAPEFRUIT
- TANGERINE
- BLENDED ORANGE AND GRAPEFRUIT
- CONCENTRATES

Use 'ROCHE'
ASCORBIC ACID
for Standardization

VITAMIN DIVISION • HOFFMANN-LA ROCHE INC. • NUTLEY 10, NEW JERSEY

ADVANCES IN TECHNOLOGY

H_2O_2 Treatment Improves Quality of Swiss Cheese By Killing Bacteria Without Inactivating Enzymes

Swiss cheese made from hydrogen peroxide-treated milk has better body, texture, flavor and eye formation than similar products made from either raw or pasteurized milks. This is attributed to retention of properties and enzymes of raw milk with greater bacterial reduction than is accomplished by pasteurization, particularly of gas-formers.

Milk used in the experiments ranged in quality from rejectable to grade A. Lots were clarified at 95 F. and divided into three 700-lb. portions. First portion was used raw, 2nd was pasteurized, and the 3rd was treated with H_2O_2.

The H_2O_2 was diluted with 10 times its volume of cold water, then added to the milk at 120 F. at rate of 0.2 percent. Milk was held at 120 for 30 min. then cooled to 100 F. and catalase (0.5g. to 2,000 lb. milk) was added to dissipate the H_2O_2.

L. bulgaricus, S. thermophilus, and *P. shermanii* cultures were used in somewhat larger quantities than is customary. Other procedures were standard.

Little difference was found in acidity of vat milk, whey at cutting, and whey at dipping. However, bacterial counts on the H_2O_2-treated milks were much lower than on the pasteurized milks—reductions averaged 99.6 percent for treated milks, 96.2 for pasteurized. Coliform counts on raw milks averaged 4,339, on pasteurized, 10, and on treated milks 4. Anaerobic spore-formers were wiped out by H_2O_2, but were only reduced in the milk that was pasteurized.

In eye formation, 80 percent of the treated milk cheeses rated grade A, as against 20 percent of the raw milk cheeses and none of the pasteurized. Flavor scores of H_2O_2 cheeses averaged 34.3, raw milk cheeses 33.4, and pasteurized milk cheeses, 32.7. Body and texture scores were 19.6, 18.7, and 18.3, respectively.

In preliminary batches, both Cheddar and Jack cheeses were improved in body and texture by the above treatment.

Digest from "Hydrogen Peroxide Has a Place in the Making of High Quality Swiss Cheese," by A. J. Morris, P. B. Larsen, and J. D. Johnson, *Farm and Home Science,* (Published by Utah Agr. Expt. Sta., Logan, Utah.) 79-80, Dec. 1951.

ENGINEERING

Electrostatic Smoking Unit

The old principle of electrostatic precipitation of smoke and fume has been newly applied to a patented method for smoking food. The apparatus comprises a metal framework supporting the customary ionizing and collecting structures, and a shelf assembly for the food. There is a source of direct current of the order of 12,000v., a smoke generator, and an exhaust blower. The shelf assembly is grounded, and is removable for loading with metal containers of food.

As smoke from the generator passes through the ionizing structure the particles of solid matter take on a positive charge. Leaving the ionizer, these particles enter the collecting structure and are deposited on the surface of the food which is in contact with the grounded shelf assembly. It is claimed that smoke is used very efficiently, so that a dense and uniform deposit can be formed on the food; also that the smoking time can be reduced from the 8 hr. previously required to about 20 min.

In a modification of the apparatus, wire screen is used for the supporting shelves so that uncanned large fish, for example, can be smoked on both sides. In another modified form meat, such as ham and bacon, is conveyed through a chamber in which smoke is deposited on them.

Digest from U. S. Patent 2,565,454, issued Aug. 21, 1951, on an application dated Sept. 20, 1947, to K. W. MacKenzie, Newton Highlands, and G. E. Andrews, Andover, Mass., assigned to Raytheon Manufacturing Co., Newton, Mass.

Nut Depositing Machine

Designed for superseding expensive hand labor, a machine has been patented to deposit and position nuts on candy bars. In its simplest form the device comprises a disc or wheel rotating vertically under a hopper containing nut meats. Suitably spaced on the peripheral edge of the wheel is a series of pockets for receiving nuts from the hopper. They are held in place by a vacuum applied through the hub of the wheel, and tubes radiating like spokes to the peripheral pockets. As the pockets and nuts reach the downward discharging position, the vacuum is broken and the nuts are deposited on the candy bars moving under the wheel. A plurality of discs or wheels are assembled to form a drum moving under the hopper, and an equivalent number of lines of candy bars move continuously under the drum.

Digest from U. S. Patent 2,566,712, issued Sept. 4, 1951, on an application dated Dec. 15, 1948, to L. H. Zeun, assigned to Peter Paul, Inc., Naugatuck, Conn.

Machine Forms Sausage With Condiment Core

In a recently patented sausage-forming machine, means have been provided for introducing a core of mustard, relish, or the like into the center of the sausage as it is being formed. Essential elements of the machine are 2 concentric tubes, with means for feeding sausage meat and condiment under pressure through the outer and inner tubes respectively.

The outer tube is tapered from feed to discharge end, and the relatively small inner tube is supported axially

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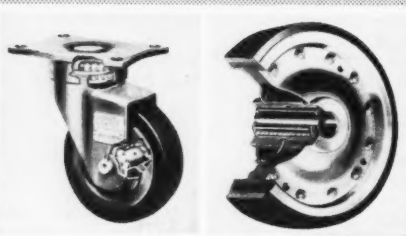

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by spaced spiders. Rotary valves control flow of meat and condiment. With the valves closed a sausage casing is slipped onto the feeding tube from its outer end. Valves are then opened, and meat and condiment under pressure flow into the casing and extrude a completed sausage. Valves are closed at the appropriate time, and the machine is then ready for the next sausage-forming operation.

Direct from U. S. Patent 2,568,491, issued Sept. 18, 1951, on an application dated Feb. 24, 1947, to L. G. Edwards, Woodlake, Calif.

Hamburger Patty Machine

Automatic mechanical production of meat patties at a rate as high as 2,000 per hr. is described in recent patent specifications. In its simplest elements the machine comprises a hopper for previously ground meat which is automatically fed to a portioning mechanism. Here the exact volume of meat is determined. It is then delivered to a mold in which the patty is formed. In the next step, the patty is automatically ejected from the machine onto a sheet of waxed paper and placed on a stack of similar molded units. The machine is powered by an electric motor through a gear box which reduces the speed of the mechanism to 30-40 operations per minute.

Digest from U. S. Patent 2,564,064, issued Aug. 14, 1951, on an application dated Dec. 22, 1945, to Harry H. Holly, Chicago, Ill.

BAKING

Vienna and Rye Doughs Finished Continuously

A machine for finishing rye and Vienna bread doughs that automatically slits the dough, sprinkles it with water, and seeds it in one continuous operation, is the object of a recently patented invention.

The unit consists of 3 zones through which pans containing loaves of formed dough pass on a motor-driven, endless chain conveyor. In zone 1 are a plurality of spaced cutting discs mounted on a belt-driven shaft. Zone 2 contains the sprinkler which includes a transverse perforated pipe connected to a supply tank. A valve in the connecting line is operated by a solenoid which is energized when a pan is directly beneath the sprinkler pipe. In zone 3 is a perforate-bottom hopper mounted between a pair of electric vibrators that are energized only when a pan of dough is positioned below.

In operation, a pan containing formed loaves of dough is placed on the conveyor where fingers move it into the cutting zone. As the pan moves

under the rotating knives, it is elevated so that the dough is slit then drops back onto the conveyor and continues into the sprinkling section. When directly under the perforated pipe, the valve opens and permits water to spray on the dough. Pan then moves into seeding area where vibrators shake hopper and discharge seeds on the now wetted dough. Pan then passes to discharge end of machine where it is elevated and discharged onto rails ready to be placed in the oven.

Digest from U. S. Patent 2,574,636, issued Nov. 13, 1951, on an application dated Aug. 1, 1947, to C. J. Gareis, assigned 50 percent to United Bakers, Inc., Forty Fort, Pa.

FRUITS

Frozen 4-1 Apple Concentrate Retains Fresh Juice Flavor

Apple juice, concentrated, frozen, and containing the original flavor and aroma constituents has been produced at ERRL. The process incorporates essence stripping of aroma in special evaporators and its return to concentrated juice. Concentrate is packed in 6-oz. cans, frozen, and stored at −10 F. When reconstituted with 3 volumes of cold water, product has the flavor and aroma of fresh juice.

Blends of both acid varieties of apples (Northern Spy, Jonathan, or Baldwin) with aromatic varieties (McIntosh, Jonathan, Winesap, Golden Delicious) gave concentrates of good quality. Juices were not depectinized, but were passed through 200 mesh screens before processing.

Cost sheets for plants producing 417 and 1,500 gal. of juice per hour, show a capital investment of $236,000 and $561,700 respectively, and a per can cost of production, based on 75 days (16 hr. per day) operation, of $0.0545 and $0.0403 respectively.

Digest from "Frozen Concentrated Apple Juice," by R. K. Eskew, G. W. M. Phillips, R. P. Homiler, C. S. Redfield, and R. A. Davis, *Industrial and Engineering Chemistry*, 2397-2403, October 1951.

FISH

Frozen Cooked Lobsters Retain Fresh Qualities

Proper freezing and storage of cooked lobsters provide means of overcoming difficulties encountered in distributing the fresh shellfish, and in dealing with a fluctuating, seasonal supply.

To retain quality comparable with freshly cooked lobsters for a period of 6 months, however, storage temperatures approximating −22 F. are required. At −5 F. the limit of satis-

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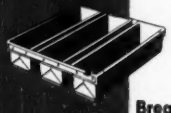
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factory storage is about 3 months, and at +15 deterioration is very rapid.

Experiments were conducted at Aberdeen, Scotland, during 1946-47 in which cooked lobsters, live lobsters, and packaged lobster meat were stored at −22, −4, and +14 F. for as long as 7 months.

On immediate thawing and subsequent cooking, as well as after storage for 107 and 231 days, flesh of frozen live lobsters was soft and shrunken and adhered to the shell. This did not occur with lobsters that were cooked before freezing.

Most striking effect was that of storage temperatures. After 107 days at +14, internal pigments covering tail and claw meat were a dull, brownish red. Some desiccation of the flesh was noticeable, the texture was spongy, and the juices had an abnormal, unpleasant flavor.

After 231 days, color, texture, and flavor of all lobsters held at +14 F. were extremely poor. After the same period at −22 internal pigment was somewhat less bright than in fresh controls, and odor and flavor of the flesh were slightly lacking in fresh sweetness. After 107 days at this temperature there were no detectable differences in these characteristics from the fresh cooked controls.

Frozen cooked lobster meat did not store as well as whole lobsters. Probable storage life at −20 F. appeared to be about 3½ months.

Tables showing weight losses due to cooking and storage, and freezing curves for raw and cooked whole lobsters are included.

Digest from "The Freezing and Cold Storage of Lobsters," by G. A. Reay, *The Refrigeration Journal*, (26 Blackwood St., North Melbourne N. 1, Australia) 3-11, Sept. 1951.

BEVERAGES

Soluble Coffee Powder By Improved Method

Recovery of useful byproducts ordinarily lost in the preparation of soluble coffee extracts is the principal feature of a recently patented process. Edible and soap fats and caffeine are removed by solvents before the water extract is prepared for evaporation. The fully extracted coffee grounds are available as a resinous composition filler.

Fresh pulverized, roasted coffee is first extracted with an aliphatic hydrocarbon having a boiling range of 86-158 F. The extract flows to a stripping column where the volatile solvent is separated from the fat and aroma constituents, which are further separated in a molecular still into soap fat, edible fat, and aroma. All or some of the latter is added to the water extract

before drying. Grounds are extracted with chloroform to remove caffeine, the extract being evaporated for separation of solvent and caffeine, then with hot water. The water extract is treated in a vacuum flash evaporator to form a concentrate that is spray-dried in an inert atmosphere. Excess aroma may be marketed as a flavoring byproduct. The entire operation may be continuous, and the end product is a soluble coffee powder containing the desirable essences unharmed by processing.

Digest from U. S. Patent 2,563,233, issued Aug. 7, 1951, on an application dated June 17, 1949, to Roger Gilmont, Brooklyn, N. Y.

CONFECTIONERY

Forms and Packages Frozen Confections

According to a recent patent a frozen confection is made by pumping a metered quantity of semi-plastic mixture into a tube of cellophane, sealing the tube, and freezing the mixture after it has been sealed. The tube is formed continuously from a strip of material fed to the machine.

In operation, the mixture is kept in semi-plastic condition in a refrigerated tank and pumped through a metering valve that delivers a predetermined quantity to the bag-filling unit. The latter comprises vertical concentric pipes, the inner one carrying the mixture and the outer serving as a guide for a strip of cellophane which is formed into a tubular casing. The inner pipe also contains a reciprocating sleeve, the length of whose stroke is about equal to that of the finished confection. The bag is filled from the bottom as the sleeve is drawn upward. Side, top, and bottom of the tube are sealed by electric irons. Individual bags are then severed at a shear station and conveyed through a quick-freezing chamber, after which they are packed for storage and transportation.

Digest from U. S. Patent 2,563,278, issued Aug. 7, 1951, on an application dated Dec. 27, 1948, to I. A. Rummel and J. D. Welch, Oakland, Calif., assigned to Henningsen Produce Company, Federal Inc. U. S. A., a China Trade Act corporation.

STORAGE

Increasing Use of Ozone In Food Preservation

Among the uses of ozone in American cold storage plants are destruction of molds, bacteria, and odors; retardation of fruit ripening; and enhancement of the aroma of fruits such as strawberries. It is used in various concentrations in rooms for the storage of eggs, apples, small

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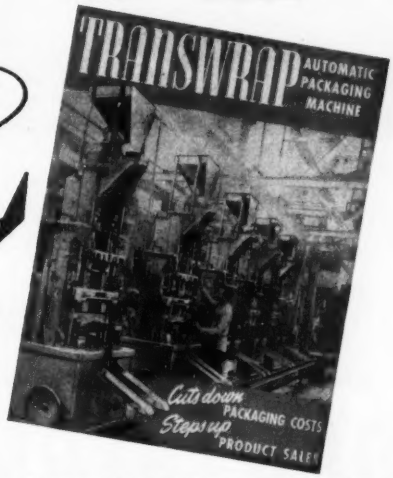

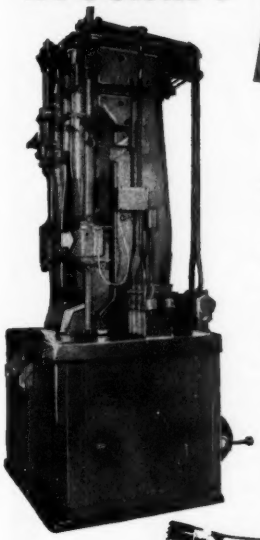

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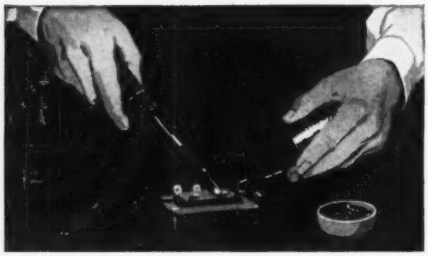

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fruits, cheese, and meat. Concentration is generally of the order of 1 ppm., although the more common bacteria and molds will be killed on exposure to a fraction of that amount.

Most important use of ozone is in egg and cheese rooms where high humidity must be maintained to reduce loss of moisture. This condition is favorable to growth of mold. Such growth is reduced by ozone in minimum continuous concentration of 0.6 ppm. Results with apples have shown great variation with different concentrations of ozone, duration, and method of application. Meat preservation is greatly enhanced by its use.

Two devices are employed for production of ozone in cold storage warehouses—ozonators and ultraviolet lamps. In the former, air is subjected to an electric discharge, known as the brush or corona discharge, between two electrodes. In bactericidal ultraviolet lamps part of the total radiation of wave length 1850 Angstrom units changes some of the surrounding oxygen to ozone. Each method of production has its advantages and preferred uses.

Digest from "Ozone and Its Application in Food Preservation," by A. W. Ewell, *Refrigerating Engineering*, Application Data, Section 50, Sept., 1950.

FATS & OILS

Antioxidant Behavior Of BHA Isomers

Of the purified isomers of BHA, the 3-isomer (3-tertbutyl-4-hydroxyanisole) is more effective as an antioxidant for lard, and has better carry-through in baked and fried foods than the 2-isomer (2-tertbutyl-4-hydroxyanisole). However, when a mixture containing at least 50 percent 3-isomer is used, advantage of the pure 3-isomer is not significant.

Commercially prepared BHA is primarily composed of the 2- and 3-isomers which belong to different classes of phenols. To determine whether there is a difference in effectiveness of the 2, their AOM stability was compared in 11 different lards from widely distributed sources. Also, their carry-through stability with crackers, pastry and potato chips was determined with 4 of the lards.

Mixtures were prepared to provide 75/25, 50/50, and 25/75 percent ratios, and tested at 0.01 percent in the lards. Effectiveness of commercial BHA was determined at the same time.

The pure 3-isomer was approximately 1.5 times as effective as the 2-isomer, and 1.1 times that of the commercial product. Mixtures of the 2 fell between the pure products, with

effectiveness increasing with greater quantities of the 3-isomer. This indicates that any mixture is better than the 2-isomer, and that the 3-isomer has little advantage over mixtures.

Crackers, pastry and potato chips, made with lard prepared for the AOM studies, showed similar trends in carry-through. However, differences in stability of pastry and crackers was not significant. And in potato chips stability imparted by the 3-isomer was not significantly greater than that by the mixture containing 75 percent 3-isomer. Commercial BHA compared favorably with the mixture.

Digest from "The Antioxidant Behavior of the Isomers of Butylated Hydroxyanisole," by L. R. Dugan, Jr., E. Hofferet, G. P. Blumer, I. Dabkiewicz and H. R. Karybill, *The Journal of the American Oil Chemists' Society*, 493-95, Dec. 1951.

CEREAL PRODUCTS

Lipid and Protein Losses In Lye Dipped Peanuts

Improved color of protein from U. S. No. 1. shelled Spanish peanuts obtained by alkali treatment, is accompanied by a loss in lipids and proteins. This loss is relatively small, especially when the dipping is carried out at room temperature. With lower grades of peanuts, however, the losses increase to as high as 1.24 and 1.99 percent respectively.

U. S. No. 1 peanut kernels were dipped: 5 min. in 0.1 percent NaOH at 125 F.; 1 min., and 5 min., respectively, in 0.5 percent NaOH at room temperature, to remove objectionable skin color. Losses following dips in 84 F. lye, followed by three 80 F. water dips, were: Lipids—0.13 percent, proteins—0.53 percent.

U. S. No. 2 and oil mill stock grade peanuts were given a similar treatment. Losses were: Lipids—0.79 and 1.24; proteins—1.06 and 1.99, respectively.

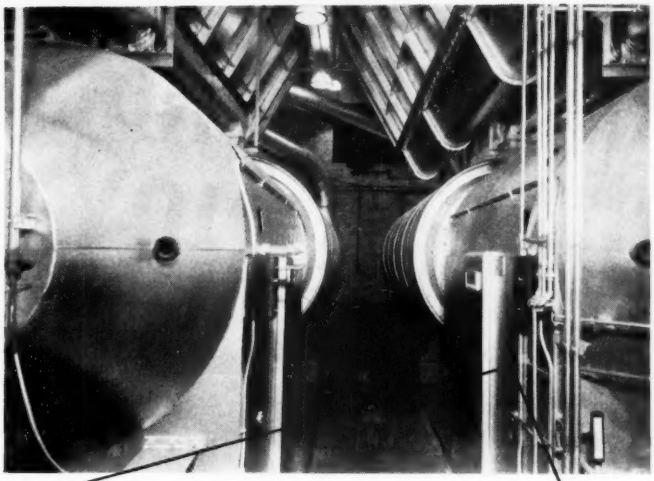
Digest from "Lye-Dipping For the Removal of Objectionable Skin Color From Various Grades of Shelled Spanish Peanuts," by J. Pominski, E. J. McCourtney, M. F. Stansbury, E. L. D'Aquin and H. L. E. Vix, *The Journal of the American Oil Chemists' Society*, 513-15, Dec. 1951.

MISCELLANEOUS

Causes of Ammonia Explosions

Fires and explosions in compressor rooms are thought to result from the presence of some other substance, possibly hydrogen, that has accumulated in the condensing system and is carried with the first batch of ammonia to escape.

To substantiate this theory, the author cites a number of cases where flash fires were ignited by temperatures



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INSULATION FOR HIGH & LOW TEMPERATURE

below the ignition point of pure NH_3 and other cases where floods of clean NH_3 were not ignited by open flames. He concludes that the whole problem of ignition following a break centers around the cleanliness of the leaking contents.

In making new installations the following precautions are recommended: (1) Place starters for compressors in explosion-proof cases outside the engine room; (2) Build engine room large, of non-combustible material, and with a high ceiling; (3) Place NH_3 receivers out of doors; (4) Tap a pressure relief valve on the condenser system, and (5) Install properly designed purging equipment and traps in the system.

Digest from "Mysterious Ammonia Explosions," by T. R. Hughes, Refrigerating Engineering, 859-62, 914, Sept. 1951.

Recovering Glutamic Acid From Steffen Waste

In accordance with a recently patented process, a method has been developed for treating Steffen waste water (containing less than 8.5 percent glutamic acid on the dry solids) to produce a glutamic acid of high purity. Further, about 75 percent of the alkali metals contained in the waste water can be recovered in the form of potassium and sodium sulphates containing 45 percent or more of K_2O, useful as fertilizer.

The process is particularly applicable to Steffen waste water of natural high alkalinity, having a pH 12.7-13.0. In such waters it has been found that potential glutamic acid, in the form of pyrrolidine carboxylic acid, will hydrolyze almost completely when treated for a sufficient length of time at a proper temperature without addition of alkali or acid.

The hydrolyzed product is carbonated to remove lime until pH is about 12, after which it is concentrated to 20-40 percent dry substance. H_2SO_4 is then added to reduce the pH to 3.0-3.2, whereupon potassium and sodium sulfates crystallize and are separated. Remaining liquor is further evaporated, after treatment with activated carbon if deemed desirable. The second evaporation causes further crystallization, and the process is continued until the liquor contains 65-75 percent dry substance, at a temperature of 150 F.

After removal of all crystallized salts, the liquor is diluted with water to 60-70 percent dry substance and allowed to cool. Glutamic acid of 92-98 percent purity will crystallize out.

Digest from U. S. Patent 2,535,117, issued Dec. 26, 1950, on an application dated June 15, 1948, to A. N. Bennett, Denver, Colo., assigned to Great Western Sugar Co., Denver.

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Manufacturing Plants in 22 Cities Around the World—PLANTS AND OFFICES: BAYONNE, LINDEN, NEW JERSEY CHICAGO, ILL. • HOUSTON, TEXAS • NEW ORLEANS, LA. • NEW YORK, N. Y. • NEWARK, RICHMOND, SAN FRANCISCO, SAN PABLO, SOUTHGATE, CALIF. • SPARROWS POINT, MD. • **FOREIGN PLANTS:** BRISBANE, FREMANTLE, MELBOURNE, SYDNEY, AUSTRALIA BRISTOL, ENGLAND • BUENOS AIRES, ARGENTINA • HAMILTON, ONTARIO • LIMA, PERU • RIO DE JANEIRO, BRAZIL • SINGAPORE

Aluminum In Food Handling

—*Continued from page 80*

ing containers, aluminum offers essentially the same advantages here as in the containers described above. Workers like the lightness of aluminum hand trucks. With power trucks, however, the weight-saving consideration is not quite so important, except in old buildings or buildings of light construction where floor loads must be kept relatively low. Like aluminum containers, lightweight aluminum trucks are particularly useful in the food industry where both sanitation and resistance to corrosion is important.

Barrel and drum trucks built with major aluminum components are used extensively by bottlers and brewers. And lift trucks are widely used in other phases of food-product manufacturing. A pallet lift-truck of aluminum, featuring special wheels that automatically retract when the forks are lowered, is manufactured by Market Forge Co., Edwards, Mass. Aluminum skids are used, too—for the corrosion-resistant feature of the metal and its light weight. These skids are particularly desirable where female labor must handle them manually, says one manufacturer, Union Metal Manufacturing Co., Canton, Ohio.

Eases Stair Work

At least two special types of two-wheel hand trucks are made for ease in going up and downstairs. One has an aluminum frame equipped with a high tensile steel nose which slides over the edges of steps (Honeyman Manufacturing Co., Portland, Ore.).

Another has an aluminum "crawler" attachment on the under side of each side member (two manufacturers report this type—Associated Services, Carlinville, Ill., and Stevens Appliance Truck Co., Augusta, Ga.). Here, rubber treads, arranged similar to the tracks on caterpillar-type tractors, literally crawl over the edges of steps or other obstructions. Special models are made for the handling of beer kegs and bottled beverages.

An interesting application of aluminum in hand trucks is found in the "Liftomatic" truck. This two-wheel unit is designed to handle drums weighing up to 1,000 lb. and varying in height from 7 in. to 4½ ft. Its design is unique in that it engages and carries the drums from the top only. Two jaws hold the drum by the chime, closing and opening completely automatically. Thus, hand operation is eliminated in pick up and release.

Savings in transportation costs in getting food products from point of

Here's what
IN-PLANT CHLORINATION can do

"Member of National Canners Association"

BAKER CANNING COMPANY

Packers of Number 10 Tins
Wisconsin Quality
Peas
Whole Kernel Corn

Address all Communications to
Theresa, Wisconsin

Theresa, Wisconsin
April 4, 1949

Wallace & Tiernan Co., Inc.
Newark 1, New Jersey

Gentlemen:

We have been using In-Plant Chlorination for a few years, and feel that this piece of equipment is just as important in a canning factory as any other piece of equipment used in the processing of canned foods.

The first year we installed In-Plant Chlorination we had chemists make bacteria counts, and checks at approximately fourteen points throughout the plant, such as picking table belts, flume systems, washers, blanchers, fillers, closing machines etc. In making these tests we did not use In-Plant Chlorination for one week, and the next week we used In-Plant Chlorination in order to make comparisons as to bacteria count.

The reduction in bacteria count, between the two operations is almost unbelieveable. We found that by using this equipment properly, and increasing the dosage at clean-up time, we eliminated bacteria at many of the check points. One cannot, however, install In-Plant Chlorination and forget about a good housekeeping job. This would be an error, indeed.

However, by having In-Plant Chlorination, and doing a good job of house-cleaning, one can eliminate the building up of bacteria in most any piece of equipment. We do find that by using In-Plant Chlorination the clean-up time necessary at clean-up periods is practically cut in half.

You may use this letter in part or in full - for any purpose you care to.

Yours very truly,

BAKER CANNING COMPANY

By Robert Baker

RDB:eml

In-Plant Chlorination, engineered by Wallace & Tiernan, can help your plant, too. Bacterial counts are reduced, odors controlled, and on-the-line time for processing equipment increased when you use this proven method.

Call your nearest W & T Representative now for complete information.

Other services by Wallace & Tiernan Associated Companies include Merchen Feeders for precision blending BY WEIGHT; Richmond Sifters for all separating problems involving powdered or ground materials; and Richmond Permaflux Magnets for the complete elimination of any ferro-metallic contamination of your food line.

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CHLORINE AND CHEMICAL CONTROL EQUIPMENT
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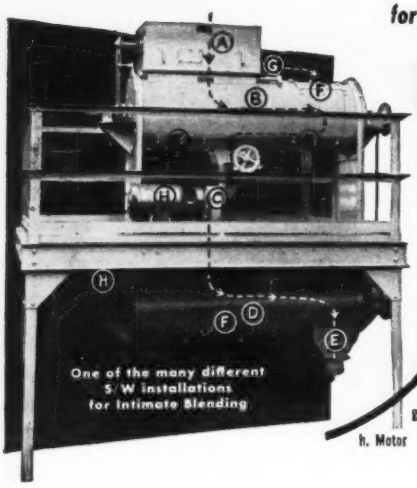
33

LOOK WHAT'S NEW IN

intimate blending

Now... A Step Beyond Mixing for the Food Industry



a. Protective Brush Sifter
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c. High Speed Blending Mill
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g. Safety Vent Collars
h. Motor

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When specifications call for powder blends of high uniformity, Sprout-Waldron's *Intimate Blending Systems* provide the perfect solution. Engineered to individual needs, these versatile systems are indicated wherever powders 100 mesh or finer are to be blended to smooth-flowing, lump-free uniformity — especially formulas including liquids or fibers as well. Ruggedly constructed, the compact assemblies operate on the gravity flow principle and take up a minimum of floor space. They are misers on power consumption, too — are quiet, smooth-running, and clean. Dust-free operation is another vitally important S/W feature. Easy accessibility and simplicity of interior for cleaning, etc., assure advantages which have been developed through long practical experience. The minimum of moving parts means additional economies in maintenance. Sprout-Waldron specialists have successfully solved intimate blending problems in a great many widely different food processing plants from coast to coast. Their expert advice is yours for the asking. It may help step up production, improve your product and working conditions in the plant, and increase profits. Write for Bulletin I-846 today! Address Sprout, Waldron & Co., Inc., 38 Logan Street, Muncy, Penna.

Sprout-Waldron
Manufacturing Engineers
MUNCY • PENNSYLVANIA

134-A

production to the jobber or retailer, and in sanitary condition, are reported with aluminum pallets. This method, adopted by our army and navy during World War II, is reported gaining popularity in many fields, including food processing. Products are handled on aluminum pallets in unit loads by means of mechanical handling equipment.

An example of labor saving is cited: Movement of a loose cargo of 100 tons required 682 man-hours, but only 203 when the same cargo was palletized. Approximately 77 pallets accommodated the same amount of goods that called for 4,080 separate packages when shipped loose.

Another instance: It formerly took 14 men 4 hr. to unload a freight car stowed by old methods. But it is reported that with aluminum pallets, the same job is handled in 2 hr. by an operator with a fork truck. Also, in a case of loading fruit, the fork truck now handles 30 boxes at a time, whereas hand truckmen moved only 5 at a time.

One user recounts that a single operator with a single truck loads 315,000 lb. of potatoes to fill 7 refrigerated box cars daily. The potatoes are handled by piling the bags on aluminum pallets to form unit loads.

Figures on Freight Savings

At present, all pallets take the same freight rate as the goods they carry. Thus, a carload of canned fruits and vegetables involves a charge of $18.50 for 36 pallets (at 100 lb. each) on a typical shipment from New York to Chicago. A standard 40 by 48-in. aluminum pallet weighs 36 lb., compared with about 100 lb. for same size pallets made of other materials, achieving a freight saving of 64 lb. when aluminum is employed. There is also a saving on the return trip.

An average box car will hold 540 pallets which, in aluminum, weigh about 19,000 lb. Freight charges however are based on a minimum carload weight of 30,000 lb., hence weight saving here is the difference between 30,000 and 54,000, (540 100-lb. pallets), which is 24,000 lb., or 44 lb. per pallet.

Shippers find that aluminum pallets impart no odors to their loads because they absorb none, being impervious to food smells, grease or dirt. In food handling, this is important because it means that the pallet can be loaded with fish, soap chips, or bread, without discrimination as to subsequent or previous loads. Aluminum pallets also afford added safety factors, since they are non-sparking and noncombustible. And even when badly worn, there are no splinters.

Aluminum has the same sanitary

advantages in conveyors as in portable equipment. For instance, one conveyor, a pre-fab all-aluminum unit, can withstand temperatures up to 500 deg. F., operates at any speed up to 100 ft. per min., and for complete sanitation has an aluminum belt. The standard size handles 250 lb. per sq. ft. with other sizes custom built to meet special needs. Standard lengths are 5-ft., with widths from 6 to 36 in.

This unit may be used for floor-to-floor conveying, and can be either mounted on the floor or hung from the ceiling. The manufacturer, Mercury Conveyor Co., Inc., Hillsdale, N. J., lists its use by bakers, breweries, confectioners, canners, dairies, food processors, ice cream manufacturers, meat packers, bottlers, and wineries.

Swift and Company uses such a conveyor (45 deg. inclined) to carry quarters of beef from first floor to second-floor cutting room. Also, many supermarkets use conveyors of this type in the prepackaging of meats and vegetables.

Employed in Air Conveyors

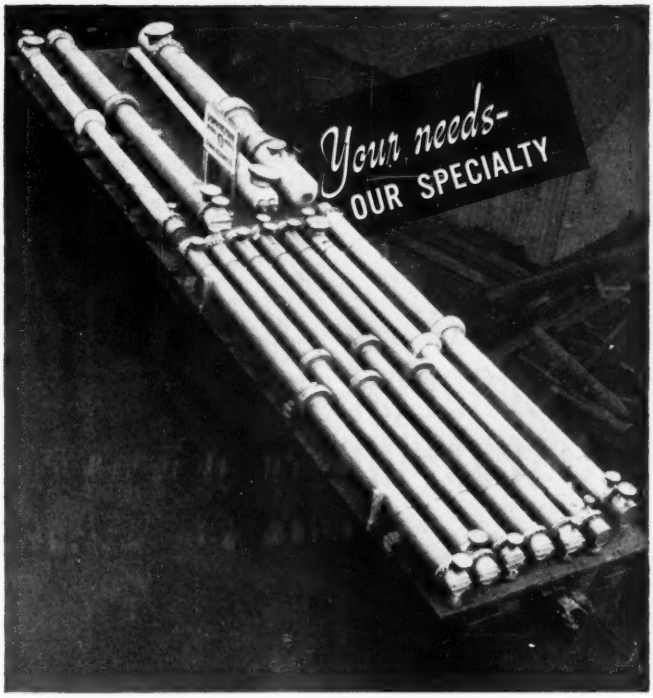
Aluminum is playing an important part, too, in pneumatic conveyors, particularly where sanitation is a problem. An excellent example is the flour mill recently built in Los Angeles by General Mills. In this new plant, operation of much of the equipment is automatic. Pneumatic conveying systems containing more than 5,000 ft. of aluminum tubing, carry the product from one machine to another with little or no attention. These conveyors are termed much cleaner in operation.

Portable skate-wheel conveyors can be shifted easily from point to point in plants or at the loading platforms. The survey found them being used particularly in breweries. A 10-ft. section weighs only 26 lb., yet has a capacity up to 150 lb., according to one manufacturer, Hazlett Chute & Conveyor Co., Oaks, Pa. The wheel and roller conveyors often are furnished with aluminum framework.

An aluminum guide for fixed roller conveyors is used for changing the direction of movement at conveyor intersections. This consists simply of a curved structural element with vertical skate-wheel-type guide rollers, the whole assembly designed for easy attachment to conveyor side channels.

This guide can be lifted easily by one man, according to the manufacturer, The Lamson Co., Syracuse, N. Y. It forms an essential element in achieving flexibility of movement with fixed roller-type conveyors. At a four-way crossing, for instance, two-way traffic in each of four different directions is possible by simply shifting the position of the guide.

End (Resume reading on page 81)



One of six carloads of Heat Exchangers, Coolers, Condensers and Reboilers designed and fabricated by the Heat Transfer Division of DOWNINGTOWN for a chemical plant. Materials used consist mainly of Type 304 Stainless Steel . . . construction meets requirements of the A.S.M.E. Code.

DOWNINGTOWN solicits your inquiry for heavy duty steel and tube equipment fabricated of Aluminum, Inconel, Nickel, Phosphor Bronze, Copper, Silicon Bronze and various grades of Carbon Steel. Some of these are welded by the Inert-Gas-Metal-Arc method. DOWNINGTOWN is experienced in building equipment with Bimetalic, Finned Tube and Impregnated Graphite.

Design and construction meet requirements of A.S.M.E. Code or other agency specified by customer. Equipment of our design is sold on a guaranteed performance basis or we will fabricate to customer's drawings. Modern facilities available for radiographing where required. Remember: *"Your Needs Are Our Specialty!"*

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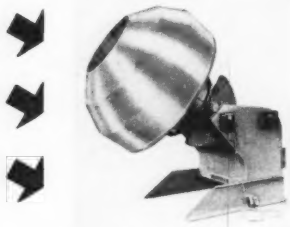

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The exclusive Ransome baffle design directs ingredients into two merging, fan-shaped formations . . . assuring a thorough mix in less time. The drum is *rotated* by motor and *tilted* by motor—and discharges, automatically and *completely*, as clean as a whistle.

Capacities up to 3000 lb reduce handling and re-handling and increase output.

Write for Bulletin R-708 on Worthington-Ransome Mixers, built from designs developed from nearly a century of mixer experience.

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORP.
RANSOME INDUSTRIAL MIXER DIVISION
DUNELLEN, NEW JERSEY 24YR.1.4

Questions & Answers

THIS MONTH'S PROBLEM

Question—Some fruit juices, when concentrated under vacuum, are not as sensitive to heat as others. For example, orange and pineapple juices must be concentrated under 75 deg. F., while grape juice can be handled at 140 deg. F. without adversely affecting its flavor. Therefore, in designing a low-temperature high-vacuum evaporator, what would be the relationship between temperature of a juice in the evaporator and the original cost of the equipment? Also, what would be the relationship between temperature of a juice in the evaporator and operating cost?

Answer to December Problem

The Question Was—I've been attempting to salt peanuts in the shell, but have been unable to prepare a satisfactory product. Can you give me details on the procedure for salting peanuts in the shell?

Answer—Prepare a supersaturated salt solution and pump this brine into a steam-jacketed kettle, into which is lowered a wire-mesh basket containing unshelled peanuts. Secure the cover on the kettle and heat the brine just short of the boiling point. Continue heating so that the low vapor pressure created within the kettle will force the brine into the permeable peanut shell.

Now turn off the steam, open the kettle, and remove the basket of nuts. After draining the brine from the peanuts, tranfer them into a rotary dryer. Thus driving off the moisture leaves salt crystals inside the shells.

Finally, put the peanuts in a revolving oven heated to about 800 deg. F., timing this oven operation according to type of roast desired.

Wants to Bleach Irish Moss

Question—Before extracting the water-soluble gel from Irish Moss (Chrondus crispus), the marine plant must be sun-bleached. Since this procedure takes too long, we wonder if you could tell us of a chemical way to bleach the moss.

Answer—There is no satisfactory chemical method of bleaching the raw moss. In France, sulfur dioxide is employed to bleach the raw seaweed. However, this method destroyed many useful properties of the water-soluble gel.

Best practice is to purchase the moss in its natural state (unbleached), then remove the color during processing with a suitable adsorbant, such as activated carbon.

Has Broken Glass in Bottles

Question—We have trouble with broken glass in our milk bottles. And because of the opaqueness of the liquid, we can't detect these glass fragments with the naked eye. Do you know if there is an empty bottle-inspecting device on the market that will solve our problem?

Answer—Your problem is unusual. We believe your trouble lies in proper operation of the washer. Here, the final rinse should remove any foreign matter (broken glass in your case) left behind during washing. Perhaps you should explain the problem to the manufacturer of the unit.

With reference to an inspection device, Radio Corp. of America supplies a unit that automatically inspects and throws out any filled bottles of Coke containing extraneous matter. However, this machine operates only on bottles containing transparent liquids.

We have asked RCA engineers about a unit for milk bottles. But due to the fact that milk is opaque, a glass fragment-detecting device would have to operate on a different principle.

Only present method for detecting extraneous matter in empty bottles is by visual observation. So, if the glass problem is not cleared up when the washer is properly serviced, you may have to install a large magnifying glass at the empty-bottle conveyor and place an inspector on the line. These inspection units are used in most carbonated beverage plants, and they can be obtained ready to install.

How Would *You* Do It?

Readers are invited to submit to FOOD ENGINEERING answers to questions in this department, especially to "This Month's Problem." Selected answers will be published, with credit (unless you specify otherwise). We pay space rates.

What Is *Your* Problem?

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

For Increased Consumer Appeal...

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ENRICHMENT costs so little. Yet few product improvements offer food processors who use cereal grains a better opportunity for public service while gaining—at the same time—positive sales advantages. Today, the benefits of Enrichment are so obvious that *enriched foods* have become *preferred foods* in the eyes of millions of American housewives.

To enable the food processor to reap the double benefit of public service and consumer preference, Merck makes a wide variety of Vitamin Products. Specially formulated to meet the different enrichment requirements for white flour, white bread, corn meal, grits, macaroni, spaghetti, noodles, pastina, and other cereal products, these Vitamin Products are the culmination of almost two decades of pioneering experience in the research and production of pure vitamins.

Merck Vitamin Products for Enrichment are preferred for their uniformity, dependability, and ease of use.

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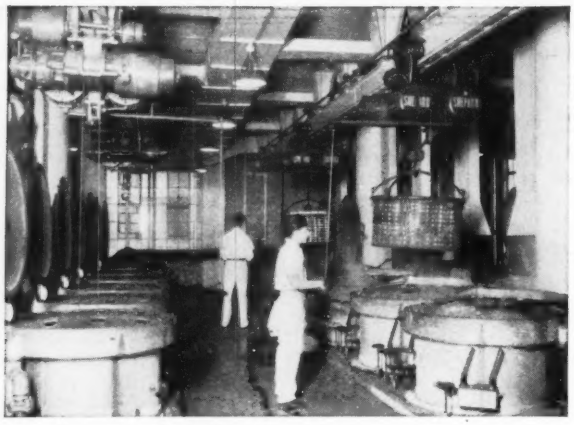
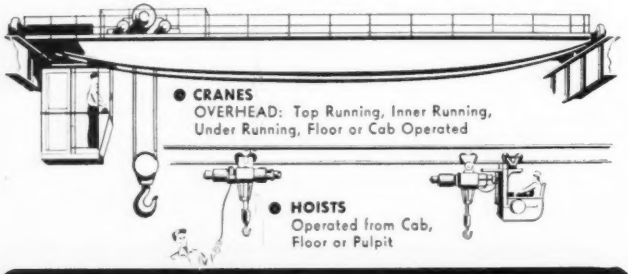
THROUGH THE AIR



HERE'S THE THRIFTY WAY to handle materials—because it uses only a minimum of manpower. Pick up the load with a Shepard Niles Hoist, then deposit it where you want it. There's no unnecessary handling, no wasted floor space. Instead, you make room for more production or storage.

IT'S NOT ONLY LESS COSTLY, it's faster and easier when you handle it through the air. But which hoist will suit your plant best? The Shepard Niles representative can give you this answer, based on a careful study of your plant's needs. Send for Bulletins 127 and 177 today — ask to have a representative call.

Specialists in loads through-the-air since 1903.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Cottage Cheese Enigma

Question—Recently, we have experienced difficulty in producing a satisfactory cottage cheese. Body and flavor of our starter seem to be all right, but the cheese is slow in setting and it does not have the desired flavor.

Answer—Since your starter is apparently satisfactory, indications are that the milk you are using for your cheese contains an agent that is inhibiting the growth of lactic acid bacteria. Quite possibly this could be one of the antibiotics used in treating cows for mastitis or a quaternary ammonium compound used to sanitize milking machines, cans, or tanks.

We suggest you check on the producers supplying milk used for cheesemaking and, if any of their cows are being treated with antibiotics, milk from these cows should be withheld for at least 48 hr. after the last treatment.

Should this investigation fail to solve the problem, it may be necessary to apply the resazurin test to each batch of milk before it is made into cheese. Solution used for this test is prepared by dissolving 1 resazurin tablet in 200 ml. of sterile water. This solution should be made up in an amber bottle, stored in a refrigerator, and then used within a week.

To perform the test, add 1 ml. of starter and 1 ml. of resazurin solution to 9 ml. of milk in a sterile test tube and place in a 98-deg. F. water bath. Examine sample after 20 min. and each 5 min. thereafter, noting the time required for the sample to turn white.

The color should change in 35 min. or less. If 50 or more minutes are required, the milk apparently contains some inhibiting agent.

When the offending source has been determined, the dairymen should be instructed as to proper use of antibiotics or quaternaries.

Antioxidant Query

Question—Kindly give me informa- about the new Food & Drug Administration regulation forbidding use of hydroquinone as an antioxidant for greasy food products.

Answer—Hydroquinone was briefly permitted as a fat antioxidant in foods, but was later forbidden when more tests indicated unforeseen hazards.

It is our understanding that the presence of hydroquinone in a food would be regarded by F&DA as adulteration under Section 402 (a) (1) of the Federal Food, Drug, and Cosmetic Act (specifying that "a food shall be deemed to be adulterated if it bears or contains any poisonous or deleterious substances which may render it injurious to health").

Apple Concentrate Gelling

Question — We just installed a double-effect evaporator and initiated it by test-running several batches of apple juice. But each time we tried to raise the juice-Brix to about 70, the concentrate would gel.

Can you suggest a method to eliminate such gelling?

Answer—Depending upon the variety of apples and their condition when pressed, some juices will gel after they have been concentrated to a 55-percent total solids content. In still other juices, gels form only after a 71-percent total solids level has been reached.

Treating the juice with pectinol, the pectin-decomposing enzyme, is the most effective method of preventing gelling at high concentration. By treating apple juice in this manner, most of the pectinous material is hydrolized to galacturonic acid so that an 80-percent soluble solids concentrate can be produced without gelling.

Fate of Vitamin C in Jellies

Question—After prolonged storage, will the amount of added ascorbic acid become increasingly greater farther down from the surface of pectin jellies?

Answer—On the contrary, ascorbic acid diffuses quite readily in pectin jellies, and it is readily destroyed upon coming in contact with oxygen at their surface.

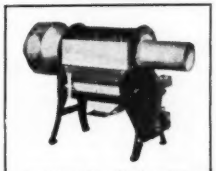
According to experiments conducted by H. Cheftel, of J. J. Carnaud & Forges de Basse-Indre, Billancourt, France, the amount of ascorbic acid in the centers of pectin jellies was found to gradually decrease during storage. And to determine whether this loss was due to diffusion of oxygen into the jellies or dispersion of ascorbic acid through them, he conducted special tests.

First, he poured a 3 cm. layer of pectin jelly (powdered pectin, sugar, water, citric acid, and 40 mg. of ascorbic acid) into a series of 20-mm. dia. and 250-mm. high Pyrex tubes at 70 deg. F. Then after the gel had set, he poured a 5-cm. layer of ascorbic-acid free jelly into each tube. Thereupon, the tubes were sealed, held at room temperature, and the amount of ascorbic acid at various depths was determined at different periods.

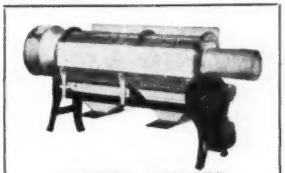
Results showed that ascorbic acid diffused through the jellies. After two days, for example, average amounts of ascorbic acid (mg. per 100 g.) were 200 at the bottom and 0 at the surface of the jellies. But after six months, average amounts of ascorbic acid were 53 at the bottom and 8 at the surface.

CRCO Bean Equipment

Cuts Costs and Improves Quality



SINGLE GRADER



DOUBLE GRADER

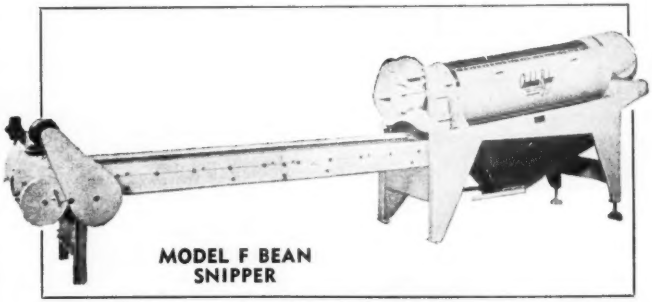
NUBBIN GRADERS

PICKING TABLES

ELEVATOR-CUTTER-GRADER

ROD WASHERS

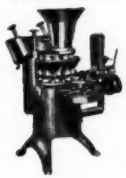
BEAN SLITTERS



MODEL F BEAN SNIPPER

EVEN FEED SYSTEMS

UNIVERSAL



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FILLERS

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Niagara Falls, New York

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113

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With labor costs running as high as $1.25 an hour for maintenance men, the cleaning tools you put in their hands become mighty important. Supply them with Fuller Floor Brushes and cut your maintenance costs. Let one stroke do the work that formerly required two or three. With Fuller Floor Brushes you get a clean sweep with every stroke, no backtracking. You'll find a size and type to meet your every need.

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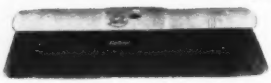
FOR LIGHT INDUSTRIAL CLEANING



Staple-set by machine—horsehair and fiber centers, outside row all horsehair. For heavier soil all fiber centers with horsehair outside row to insure a clean sweep.

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Inexpensive floor brushes for use on concrete and rough floors where metal chips and heavier refuse have to be swept. Made in a variety of long-wearing, water and oil resistant fibers.

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All floor brushes regularly stocked in widths from 12" to 36". For specifications on complete line of Fuller Floor Brushes write to . . .

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When to Recover Waste

Question—What's a good rule to follow in determining if greasy, nitrogen-containing wastes from a moderate size packinghouse plant are worth saving?

Answer—It is good practice to evaporate packinghouse wastes containing over 1 percent of protein and recover all floating grease in a catch-tank.

To determine the amount of protein in waste, analyze it for nitrogen, multiply the result by 6.25 (factor for converting nitrogen into protein), and calculate in percent.

If there is sufficient grease, it can be noted visually. If in doubt, let the waste settle for a short time, then recoverable grease will float to the surface.

Assume, by way of example, that a moderate size packing plant is killing hogs and cattle yet makes no effort to recover grease and nitrogen from the waste. Then, expected losses will run about 23 lb. of grease per 1,000 lwk. (live weight killed), and 3 lb. of nitrogen per 1,000 lwk. With small changes, these figures can be reduced to 4 lb. of grease per 1,000 lwk. and 1.8 lb. of nitrogen per 1,000 lwk. The unnecessary losses make up the difference.

Supposing the kill is 1,000,000 lb. a day, then it would be possible to save 19,000 lb. of grease (present value $1,000) and 7,500 lb. of protein (worth about $625).

Inactivating Metals in Oil

Question—We have learned that 0.1 ppm. of iron and 0.01 ppm. of copper will reduce the flavor stability of soybean oil. Is there anything that can be done to curb this effect and thus improve the oil?

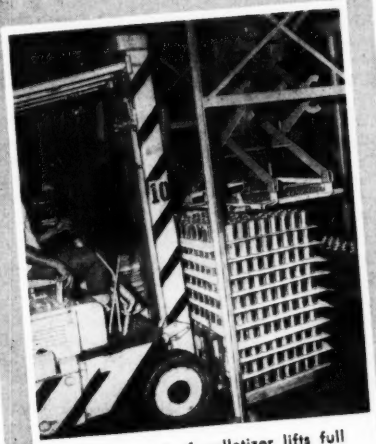
Answer—The Northern Regional Research Laboratory, Peoria, Ill., and others, have found that certain compounds, when added to soybean oil in 0.01 percent amounts, act as metal inactivators, thus improving the flavor stability of the oil. Most refiners are using metal inactivators during the deodorizing process, or they are adding them afterward. Best practice, however, is to add the inactivators before deodorizing.

Among the new metal inactivators found successful by NRRL are phytic acid, starch phosphate, and iminodisuccinic acid.

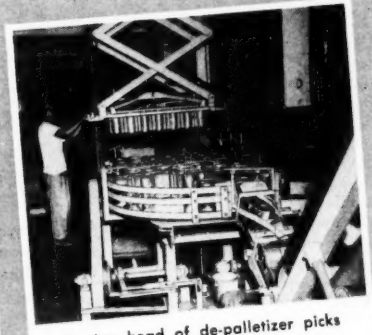
Many edible soybean oils cannot be successfully processed in iron equipment unless a metal inactivator is employed. Moreover, high vacuum and proper handling are necessary to produce bland oils.

NEW, UNIQUE PALLETIZING SYSTEM

Slashes "Bright" Can Warehousing Costs



Suction head of palletizer lifts full tier of cans each cycle and deposits on pallet, tier upon tier.



Suction head of de-palletizer picks up full tier each cycle. Cans delivered through converger in single file.

ADVANTAGES

- Faster, smoother, more efficient "bright" can handling to and from warehouse.
- Substantial reduction of all factors making up warehousing costs.
- Simple, effortless to operate.
- Operators do not require specialized training or skills.
- Simplicity of design — maintenance is almost negligible.
- Permits expanded production without increased warehouse space.
- Handles all can sizes. Readily adapted to varying can requirements.
- Prevents stack spoilage by "leakers." Marks their location for removal.

In use at Hawaiian Canneries, Inc., for several years, this new can palletizing equipment has proved itself. It can be inserted right into your present processing line. Palletizing unit collects and palletizes at rates up to 300 cans per minute; de-palletizing unit puts cans back on processing lines at speeds up to 1000 per minute.

You reduce all warehousing cost factors, conserve warehouse space, prevent stack spoilage by leakers and generally simplify your warehousing operations. For more information, write for our descriptive folder.

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Useful New Books & Government Publications

Surveying the Fungi

THE MOLDS AND MAN. *By Clyde M. Christensen. Published by the University of Minnesota Press, Minneapolis 14, Minn.*, 1951. 244 *pages;* 5¾x8¾ *in.; cloth. Price* $4.

This introduction to the science of fungi will be of value to those engaged in food technology in general and dairy bacteriology and plant waste control in particular. It also can be used as a basic text for students of mycology.

Processors plagued with losses due to molds can benefit by studying the habits of these organisms. Millions of dollars worth of grains, milk, eggs, and seed plants are lost annually that might be partially saved with proper control procedures.

The author presents the basic facts about fungi in a fast-moving manner. How fungi live and reproduce and how they affect plants and animals are revealed in an understandable form—even for the layman.

The reader can also obtain a background for antibiotics from this book—especially with food preservation in mind—even though the subject isn't specifically covered. A classification of the fungi is published as an appendix to the general text.

From Range to Roast

MEAT TECHNOLOGY. *By Frank Gerrard. Published by Leonard Hill Ltd., 17 Stratford Place, W. 1, London, 1951. 309 pages;* 5½ *x* 8¾ *in.; cloth. Price 15s.*

This treatise on meat has made available valuable descriptions and methods for those interested in the raising, slaughtering, dressing, and preservation of livestock. It is a second and revised edition.

Cattle and beef, sheep and mutton, pigs and pork, poultry and rabbits are some of the topical headings. And technics dealing with the preparation of these meats for human consumption are detailed. Numerous sample breakdowns on the cuts described are presented by name, animal location, and weight.

In addition, there are included many photos, diagrams, graphs, and representative plant forms. The text is concise and simple, but the true student will find it complete.

A special chapter is devoted to the meat-requirements of man. Here, meats are analyzed as to their metabolic and nutritional effects.

Packagers Cataloged

OFFICIAL PACKAGING MACHINERY DIRECTORY. *Compiled by the Packaging Machinery Manufacturers Institute, 342 Madison Ave., New York 17, N. Y., 1951. Pages — open for future additions;* 6½ *x* 8¼ *in.; loose-leaf—leather bound. Price* $10.

This book provides detailed listings of makers of the various types of packaging machinery now available. A ready reference, it should prove of decided value to purchasing agents, superintendents, and engineers.

Two sections are incorporated. The first tabulates manufacturers alphabetically, with type of machines made and company addresses, while the second cross-indexes the first. In the latter, kind of equipment is used as the alphabetical guide, with the makers of each mentioned under each classification.

The "How" of Surface Agents

THE SURFACE CHEMISTRY OF SOLIDS. *By S. J. Gregg. Published by Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y., 1951. 297 pages; 6 x* 8¾ *in., cloth. Price* $8.50.

What's behind the chemical and physio-chemical reactions that take place on the surfaces of solids—is the theme of this technical treatise. Written for the scientist, the volume covers many phenomena occurring in the processing of foods.

Primarily prepared for all technical fields, the chapters will be found of more than passing interest to food researchers. Among the headings are: Adsorption of Gases and Vapors by Solids, Active Solids, Adsorption From Liquids, Chromotography, and Catalysis and Chemisorption.

The text is liberally documented with formulas. Even so, the average reader will be able to get a sound acquaintanceship with the subjects. The author's aim has been to give a brief survey of the branches of this rapidly growing field rather than to be exhaustive in detail.

About Hazardous Substances

HANDBOOK OF DANGEROUS MATERIALS. *By N. Irving Sax. Published by Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y., 1951. 848 pages;* 7½ *x* 10¼ *in.; cloth. Price* $15.

This reference reviews the hazardous factors of over 5,000 materials—alpha-

betically arranged and concisely listed. Each individual listing includes: Hazardous properties — either explosive, toxic, radioactive, or other; storage and handling precautions; synonyms; chemical formula, molecular weight, and melting point; physical description; and I.C.C. shipping regulations.

In addition to the alphabetical listings (Section I), there are complete chapters devoted to explosives, fungus diseases and fungicides, radiation and radiation hazards, and detailed I.C.C. shipping regulations.

The section on fungus diseases will be of interest to most food packers—since there appears to be at least several fungi associated with almost every phase of the industry. In fact, the author details species most apt to be found, then discusses known diagnoses and remedies.

Industrial physicians, safety inspectors, plant managers, and research and development workers should find this volume a handy reference.

Government Publications

PRODUCTION OF MANUFACTURED DAIRY PRODUCTS, 1950. *Department of Agriculture, Statistical Bulletin* 105. *Price* 30c. Gives the customary detailed statistical review, showing all manufactured milk products historically and by geographic divisions, thus permitting analysis according to technologic and economic considerations.

SELLING THE UNITED STATES MARKET. *By Gustav E. Larson and Marshall N. Poteat. Department of Commerce, Domestic Commerce Series No.* 29. *Price* $1. A manual intended to aid the development and marketing of products. It deals to a great extent with questions other then those of technology.

These recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated, the pamphlet is free and should be ordered directly from the Bureau responsible for its issue.

FISH PROCESSING HANDBOOK FOR THE PHILIPPINES. *By Arthur C. Avery, Fish & Wildlife Service, Research Report* 26. *Price,* 50c. Discussion of the varieties of fish and fish products of the Philippine Islands, with a well illustrated presentation of the primitive preparation technics used. The document will not show any new food engineering methods, but it does point out tremendous opportunity for new technology.

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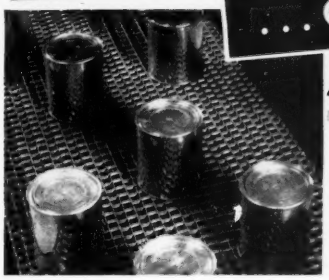

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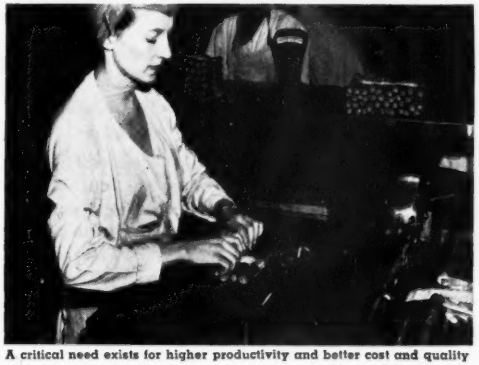

EXACT WEIGHT Scales checkweighing hand or machine wrapped meat products. John J. Felin, Philadelphia, Penna.

A critical need exists for higher productivity and better cost and quality control to offset steadily rising costs, sharp competition and flimsy profit margins and the need is urgent. Better planning and equipment is needed. High on the priority list of equipment are scales . . . *the right kind in the right place,* for good scales are the very heart of any processing and packaging operation from precision ingredient compounding to final checkweighing of the finished packaged goods. No operation today can stand a loss due to failure in ingredient compounding. No operation can absorb packaging shrink from bulk to finished product. You cannot package even a part of those paper thin profits now. From raw materials to shipping docks, alert engineers are pin pointing every spot where adequate weighing units will save money, increase productivity and speed up operation. Saving business lives today is a very active engineering job and no division of EXACT WEIGHT Scales is busier than our own engineering department. Why don't you avail yourself of this know how for your business.

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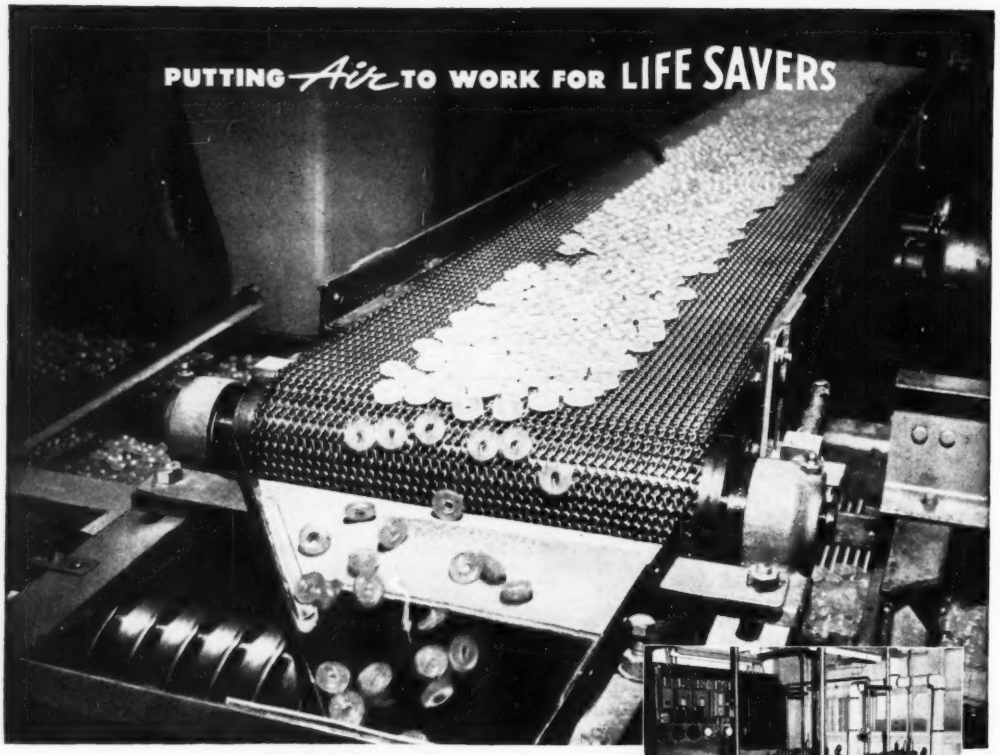


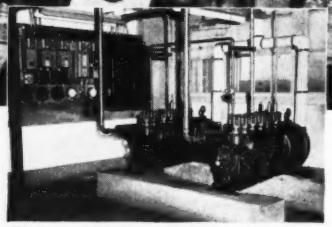
Air Conditioning by: J. P. Salmini Co., Inc., Bridgeport, Conn.

COOL AIR
STEPS UP A FLAVOR PARADE

At Life Savers, intricate machines stamp out the familiar "candy with the hole"—3,600 a minute! When formed, the candy drops are soft and pliable. During the critical next few minutes, they must be cooled quickly and evenly.

Westinghouse equipment *puts air to work* for Life Savers by providing chilled air through which the candy drops travel on conveyor belts. In addition, the candy production department is air conditioned. Clean, cool air conditioning by Westinghouse assures the uniform quality for which Life Savers are famous the world over.

There's Westinghouse Air Conditioning equipment specifically designed to make air work *for you* in food processing . . . whether it's air conditioning, air handling or air cleaning. Call the Westinghouse Air Conditioning Distributor in your classified phone directory, or write Westinghouse Electric Corp., Air Conditioning Division, Hyde Park, Boston 36, Mass.



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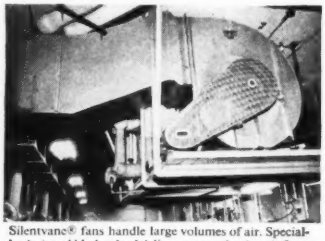
Evaporative Condensers save up to 90% in water consumption. Designed for installation where water is scarce.



Silentvane® fans handle large volumes of air. Specially designed blade wheel delivers non-pulsating air flow.

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KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

MCA Cites Stand on FD&C Law Changes; Proposes 60-Day Notice on Additives

At an inter-industry conference on chemicals in foods on January 15, in New York, the Manufacturing Chemists' Association, Inc., issued a statement presenting its position in respect to proposed changes in the Food, Drug & Cosmetic Act.

The statement includes these points and recommendations:

1. *Existing legislation* vests the Government with adequate authority over the use of chemical additives. In other words, the Government already possesses the means of obtaining adequate information and also possesses all of the remedies that are needed, in order to enable the Government to cope with any situation that may arise *after a chemical additive has been placed in use.* ("Chemical additive" does not include substances covered by the Federal Insecticide, Fungicide & Rodenticide Act of 1947.)

2. *Existing legislation* is also adequate to assure that *advance information* is supplied by industry to the Department of Agriculture, with respect to *proposed new uses of pesticides.*

3. The one area where it can be argued that present law may need strengthening is in assuring that *advance information* is supplied by industry to the Food & Drug Administration, with respect to *proposed new uses* of chemical additives.

Most Comply Voluntarily

4. As a matter of practice, both the food industry and the chemical industry today supply the Food & Drug Administration with a substantial volume of information, on a voluntary basis, with respect to *proposed new uses* of chemical additives. Speaking to this point in an address which he delivered on Sept. 19, 1951, Commissioner Crawford of the Food & Drug Administration said: "It would not be too much to require by law that all food producers live up to what is being voluntarily done by the conscientious majority."

5. Under the circumstances, the Manufacturing Chemists' Association recommends that consideration be given to new legislation containing the following provisions:

(a) On and after a given date (July 1, 1952, for example) there shall be no new use of any chemical additive in, or on, any food until 60 days after a notice of such intended use has been filed with the Food & Drug Administration.

(b) Such notice of intended use may be filed by either the chemical manufacturer or it may be filed by a food processor.

(c) The notice shall report the applicable pharmacological and toxicological data available. The notice shall also report the known composition of the chemical additive, a method for the determination of how much of the chemical additive is in or on the food, and directions for the use of the chemical additive with respect to the specific food and the specific use that is proposed.

(d) Notice of intended use shall be accompanied by samples of the chemical additive.

May Ask for Data

(e) Within the 60-day period between the filing of this notice and the date when actual use may begin, the F&DA may request the person or persons filing the notice to appear at its offices in Washington, or elsewhere, for such conferences or discussions concerning the intended use as may be appropriate.

6. Under this proposal, once the chemical additive has been placed in use, the F&DA will be in a position, in those instances where circumstances so require, to exercise the authority it possesses under existing legislation as discussed in section 1 (Existing legislation) above.

Lemons Given New Life

Use of hormone sprays has reportedly increased the life of lemons, after they reach California's canneries and packing houses, by as much as 50 percent.

Methods of treatment with 2,4-D or 2,4,5-T, developed by scientists at the U. of California Citrus Experiment Station at Riverside, Calif., have come into general use the past two years.

Stem end, or button, of the lemon is thus kept alive and green, preventing internal changes which accompany ageing of fruit and making the lemon less susceptible to rotting fungi.

Storage life of lemons in the past is cited as about four months. Now the U. of C. scientists claim that six months storage is "easily possible."

Cuts Cocoa Infestation

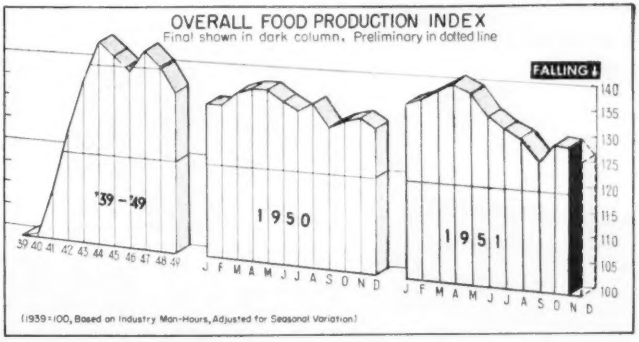
Mere air movement has solved one of the infestation problems of a large confectioner. This company has discovered that air disturbances resulting from use of unit heaters is sufficient to prevent the breeding of insects—particularly the flying type.

Initially, a complete methyl bromide system had been installed at the plant for fumigating bags of cocoa beans stored in a sealed building. And unit heaters circulated the gas inside, while exhaust fans cleared the building.

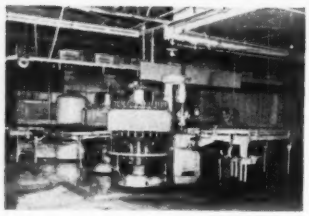
Super-Clear Wines

Fruit wines treated with pectic enzymes appear to be superior in color and clarity. In addition the enzyme treatment has speeded up operations at the wineries.

The new approach was spotlighted



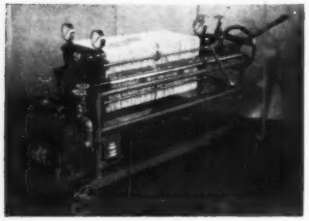
KELLY BEVERAGES
of
Stanhope, New Jersey,
filter 1,600 gallons
of water an hour
with their
HERCULES FILTERS



At the fine modern bottling plant of Kelly Beverages two Hercules pressure leaf filters, with a flow rate of 1,600 gallons an hour, are used to clarify water used in 2,500 cases of soft drinks a day.

Mr. Kelly said that the cost figures are negligible, the only maintenance being to change the filter sheets twice a week in summer and once in winter.

The filters used by Kelly Beverages have 30 frames each. The filtering media is asbestos pads made from asbestos mined at Hercules' own Arizona mine.



Write for full facts about this and other installations made for beverage manufacturers.

HERCULES FILTER CORP.
210–21st Ave. PATERSON, N.J.

following investigations at a number of California plants, where use of enzymes such as Pectinol-O and Pectinol-W hastened settling and clarification after fermentation. This technic also yields new wines that filter much more rapidly than the untreated.

When added to crushed Muscat or red grapes, the yield of free-run wine was found to increase, and pressing was greatly facilitated. Port made from untreated grapes plus one of the pectic enzymes is exceptionally rich and dark.

Promising Soil Additive

A revolutionary synthetic soil conditioner, introduced by Monsanto Chemical Co., is reported to show promise for rejuvenating unproductive farm land. Dubbed "Krilium" by the maker, the new chemical is said to be many times more efficient than compost, peat moss, or manure.

Also Krilium is described as retaining its conditioning ability for long periods, being resistant to bacterial decomposition. It is used in powder form, being easily mixed with the soil.

Primary effect of the synthetic is to form and stabilize natural soil aggregates against the dispersing or slaking action of water. It is also cited as providing better nutrient utilization through increased aeration and water percolation.

Angles on Annual Wage

Last year, there was AFL-CIO unity behind wage demands in the meat-packing industry—but last month came a split.

CIO workers in Swift and Armour plants staged "spontaneous strikes" to back up demands of the CIO United Packinghouse Workers for a $3,000 yearly wage guarantee in the place of a general wage increase.

Strikes and CIO criticism of the AFL Amalgamated Meat Cutters & Butcher Workmen came after the latter had accepted a general increase of 6c. an hour from major meat packers. UPWA-CIO President Ralph Holsten asserted this was unsatisfactory to his union members.

Government wage rules permit increases which reflect the percentage rise in living costs as reflected in the consumers' price index. But there is no provision yet for approving an annual wage guarantee, such as the CIO is asking.

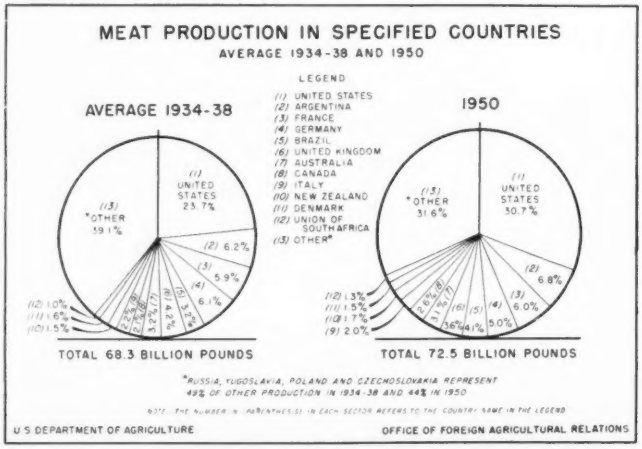
What, if anything, the Stabilization Board may recommend in a dispute over an annual wage guarantee remains to be seen. It ducked the issue in the 1944 steel dispute, but is now confronted with a similar issue in another steel dispute. What happens in steel may affect annual wage developments in meat packing.

Step Up Pollution Control

Warnings are going out to several hundred food plants considered to be infringing the Water Pollution Control Act of 1948. Copies of U. S. Public Health Service "summary reports" are being sent along as "documentation."

More than 780 food plants were investigated during the course of the study made to gather data for the PHS summary reports. These plants represent 44 percent of the industrial establishments surveyed. Only 282 of these food firms were judged to have adequate stream-pollution control.

The reports are described as more important than may first appear—



"Coals to Newcastle"

Italian Trade Commissioner to the U.S., Dr. Guido Pruner (standing at right) watches operations of a ravioli dough-stamping machine at the Prince Macaroni Co., Lowell, Mass. This plant visit is one of many Dr. Pruner is making in his survey of American production technics and materials. Standing next to the Commissioner is Mayor George C. Eliades of Lowell, and kneeling alongside is President Joseph Pellegrino of the Prince Co.

being looked upon not merely as government technical documents but rather unofficial notices.

Carl E. Schwob, chief of the Division of Water Pollution Control of the U. S. Public Health Service, emphasized that the Federal agency is going to follow each case closely. Under the 1948 Act, the states get the first opportunity to solve the problems. If they don't solve them, the Federal government can start hearings, make recommendations, and finally take the case to court.

Stricter Tomato Inspection

Tomato products will have to pass a stiffer muster this season than in the past.

Heretofore, the F&DA primarily subjected these products to the mold-count test for indication of contained rotten material. Now, in addition, raw fruit inspection, sorting, and trimming operations are to be carefully scrutinized by the Administration.

Considerable data gathered by this Federal group during the 1951 pack indicates that sole dependence upon mold counts is not safe. Main reasons for this new point of view: Objectionable plant conditions are quite often not reflected through mold counts; certain types of mold are hard to spot;

STEEL

Every Kind

Some steel products are in short supply but over-all stocks are still large, diversified

Plates, Structurals, Bars, Sheets, Tubes, etc. . . . Carbon, Alloy and Stainless Steels . . . .

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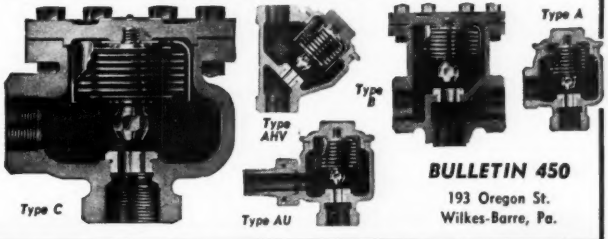
Nicholson Traps Help

CUT STEAM COST $500.000 A YEAR

At one of the nation's large processing plants a campaign to promote economical steam use by improving heat transfer efficiency has resulted in a yearly saving of $500,000. Credit for a fair portion of this is given to improved steam trapping which resulted from the installation of Nicholson thermostatic traps. To see why an increasing number of leading plants are standardizing on Nicholsons for positive drainage and faster heat transfer, send for Bulletin 450.



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CUSTOM BUILT WIRE CLOTH PARTS
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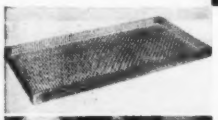
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You can be sure of getting exactly what you need in custom built wire cloth parts when you call—

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With more than 30 years experience in this field, we can work from your own prints . . . or, if none are available our design engineers will draw up prints based on your description of the job the part must do.

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WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

and quality control, at best, is difficult without a well-organized raw fruit inspection system.

Manufacturers therefore are advised to devote more time to improving and controlling plant conditions rather than merely aiming at a certain mold count figure.

An acceptable product can be made through qualified inspection of incoming fruit, adequate facilities and manpower for sorting and trimming, and speedy, careful handling of the raw stock.

Tips which the F&DA offers to aid in this approach: Installation of dry sorting tables; use of roller inspection tables; employment of the divided belt sorting system; eliminating blending of different incoming tomato batches (to avoid contaminating good with bad); and use of an informative code on the product (so it will be possible to segregate questionable packs).

Ease On "Poly" for Freezers

Frozen food packers are no longer subject to direct allocations of polyethylene for wrapping.

Plastic makers have told the NPA that they expect the situation to improve early this year, and the production group immediately put the frozen food industry in the so-called "free" area.

But there will probably be a temporary shortage until sometime in March, since one of the two plants making the material is revamping its equipment.

Hike Worker-Age Limit

Minimum age for workers in certain meat packing and bakery jobs is slated to be raised to 18 years by the labor department. Public hearings will begin this month on the proposed change in the child labor laws.

Work on the killing floor, running dangerous machines, boning, rendering, and a few other slaughtering and meat-packing jobs, have been declared "hazardous", requiring that a worker be at least 18 years old.

The bakery jobs termed hazardous include operation of certain power machines, as well as cleaning and setting-up or adjusting of the units in question.

Margarine Hits Billions

The figures aren't all in yet, but it looks as if U. S. margarine production for 1951 topped 1,000,000,000 lb. for the first time.

Per capita consumption, as estimated by the Bureau of Agricultural Economies, shows margarine at 6.7 lb. against butter at 9.7 lb. for this past year. Only eleven years ago, annual margarine consumption was 2.4 lb. against 16.9 for butter.

Several factors have accounted for the narrowing of the gap between butter and margarine:

1. Butter was scarce after the war, giving a boost to margarine consumption.

2. Margarine has a price advantage over butter—costing about 50 percent less than butter over the years.

3. The repeal of federal and state margarine laws.

New Status for Butter?

The butter vs. margarine conflict has resulted in the dairy industry taking a fresh look at some of its long standing practices.

However, problems of the industry are considered by some to be more fundamental than mere competition with margarine.

Butter has been the balance wheel of the industry—with the pricing of fluid milk (as well as other dairy products) depending on its fluctuations. Now, many dairymen are wondering whether this traditional dependence shouldn't be abandoned.

Such questions as these are up for consideration: Uniform health regula-

(*Turn to page* 195)

Profits Still Sag

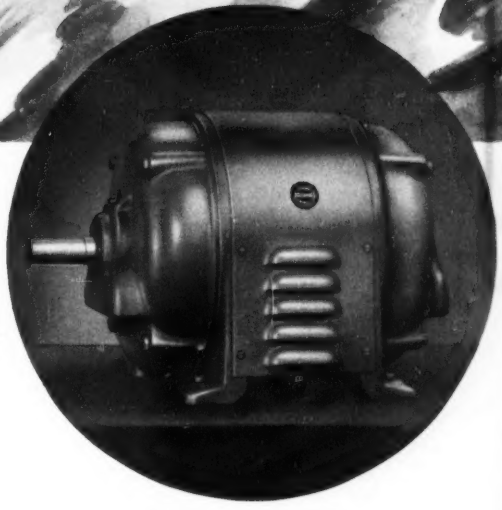
Additional financial reports from food or associated companies again bear out the recent trend—higher overall sales, but lower net profits. And in several cases the percentage profit of net sales has dipped to less than 1 percent.

The following table itemizes net sales and incomes for seven companies recently reporting:

	Sales, Net in Millions		Profits, Net in Millions	
	1951	1950	1951	1950
E. J. Brach & Sons	$38.8	$38.0	$1.11	$1.10
Canada Dry Ginger Ale, Inc	61.4	54.4	2.16	3.18
Purta Alegre Sugar Corp	20.1	19.6	2.31	2.12
Cudahy Packing Co	640.4	583.4	1.35	3.02
John Morrell & Co	307.7	291.2	1.22	0.86
Swift & Co	2,524.2	2,214.8	12.11	16.14
Cherry Burrell Corp	34.6	29.7	1.21	0.96

ASBESTOS-PROTECTED !

Asbestos cannot carbonize. That's why all U. S. Motors are asbestos-protected. Life of a motor is proportional to the life of the insulation protecting its windings. In U. S. Motors wires are insulated with asbestos to forever protect them against heat. The exclusive process of insulating U. S. Motors with asbestos insures years of extra motor life and protection against burn-outs.



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WINDINGS GIVEN MULTIPLE TREATMENT

Step by step, everlasting endurance is built into every U.S. motor by use of asbestos, the only natural fibrous element that cannot carbonize. Four progressive treatments of asbestic compounds are applied plus oven-baking, as follows:

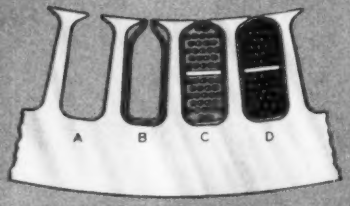
STEP 1 — Synthetic insulated wire wound into coils and inserted in slots lined with sheet asbestos.

STEP 2 — Complete stator is submerged in liquid asbestos insulating compound while pulsating current vibrates wires; then baked. A second dip and further baking follows.

STEP 3 — Plastic asbestos compound is sprayed between and over all end turns, then baked to harden throughout.

STEP 4 — Final spray seals pores; after fourth bake the surface contour is smooth.

U. S. ASBESTIC PROCESS



(A)—Empty stator slot before insulating and winding. (B)—Formed coil of asbestos providing a heat-proof wall of insulation. (C)—Cross section showing wires inserted, with asbestos coil covering entire winding. Asbestos plateboard in center of slot separating and insulating between coils. (D) Asbestocite (in color) forced around windings, penetrates every interstice.

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US MOTORS

tions, the paying for milk on the basis of fat alone, price-support for butter, and new marketing methods for milk.

Many health regulations are now used as barriers to keep milk out of certain milksheds. If there were uniform codes, a good deal more milk might be produced in areas where costs of production are comparatively low. Also pricing formulas forcing milk concentrators to pay more for their milk than for milk going into other manufactured products would be adjusted.

With milk flowing more freely, costs to consumers would be reduced and total dairy income probably raised through increased volume.

Despite its present health, the industry will be in for trouble if consumer income should fall—bringing with it a decline in the sale of dairy products. This would automatically push fluid milk into the manufacture of butter.

Some members of the dairy industry feel that support-price operations for

(*Turn page*)

Hors d'Oeuvres

• Our government has plunked down over 1,250,000 hard American dollars to buy 1,700,000 lb. of pecans—so far—for the support of shelled pecan prices. That's one way of saying "nuts" to the taxpayers.

• *Headline in a General Mills housepaper: "Betty Crocker Tells Marines How To Make Pancakes In a Foxhole." Okay, if they don't come down ventilated when being flapped.*

• Governor Tom Dewey is expected to lead a legislative fight this spring to remove the ban against colored margarine in N. Y.—one of the eight states left with such a law. Dairymen probably feel that he's "buttering" his political bread.

• *Grand prize at this year's Parade of Roses in Pasadena was won by the Minute Maid Corp. of Florida. It is rumored that the California Chamber of Commerce is clamping a strict censorship on next year's event to prevent further news leaks of this type.*

• A method for synthesizing vanilla flavoring from paper-mill waste liquids has been announced by a Canadian paper company. Looks like another case of making a purse out of a sow's ear.

• *Demand for frozen canned rabbit in the U. S. has reached large proportions. Wonder if there's any tie-in with our rapid rise in population?*

• A prominent psychologist believes that the American housewife has an emotional attachment toward butter. Grounds for divorce: Alienation of affections because of butter-in-law trouble.

DETECTO SCALES

There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.

DETECTO-GRAM RATIO COUNTING SCALE

Another Detecto-Gram Scale to speed counting operations. Model #1743 has a special counting tray attached to the beam for use when counting in odd amounts.

Write for Literature

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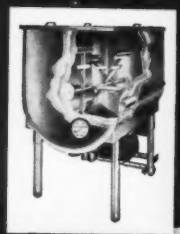
SCALE ENGINEERS IN ALL PRINCIPAL CITIES

Celanese Corp. Uses 6420 Horsepower of Frick Refrigeration

Fourteen Frick refrigerating machines are in operation at the Amcelle plant of Celanese Corporation of America, near Cumberland, Md., makers of chemical yarns. Most of these ammonia compressors have been in use since 1929. The motors driving the new vertical machines, shown in the foreground, are each of 1250 hp.

This is a large-scale example of the dependability and economy of Frick ammonia refrigeration. Power requirements, when operating in summer weather on air conditioning loads, are only 0.70 hp. per ton of refrigeration.

The really important jobs, whether for air conditioning, ice making, or other commercial cooling work, call for FRICK refrigeration.



Base your measurements of standard SAN-I-TANKS on more than gallons alone. Through Metal Glass engineering they can be made to do a special job or adapted to combine several operations. This gives these tanks greater *job capacity* . . . and this advantage can't be measured in gallons.

The jacketed "CHR" tank, featuring the dimpled jacket construction for heating or cooling medium, is ideal for heavy or light food processing. The horizontal "wiping action" agitator keeps product from adhering to tank sides. Write for Bulletin CHR-50 today!

CHR...

.... capacities beyond gallons!

CJ...

Type "CJ" is an open top, jacketed stainless steel tank that can be used for many types of hot or cold processing. Jackets for working pressures up to 150 p.s.i. For greater job capacity, tank can be equipped with side, bottom or top-entering agitators and all types of fittings and connections. Capacities: 60 to 1000 gallons. Write for Bulletin JS-50.

STAINLESS STEEL SAN-I-TANKS

METAL GLASS PRODUCTS COMPANY

BELDING 6, MICHIGAN

New York Chicago Atlanta San Francisco Los Angeles Seattle New Orleans

butter simply postpone the day of reckoning. They argue that this approach increases the spread between margarine and butter prices and merely results in higher margarine consumption.

Camera Sizes-Up Purees

Discoloration and stratification in baby food purees are being quantitatively evaluated using black and white photography. Troubled by "graded discoloration," researchers at Gerber Products Co. worked out the new technic.

The method consists of photographing glass-packed purees. Food colors are registered by the negative translucence, and differences are spotted using a densitometer to check the varying negative intensity.

Contrast between colored and discolored zones in the puree may be accented by using suitable color filters with the camera.

Field Facts

Recent reports from food manufacturers paint a semi-optimistic economic picture—

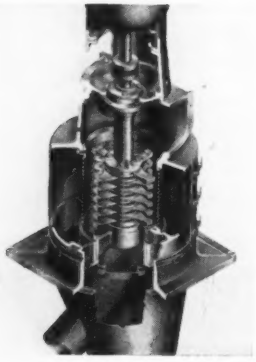
A peak will probably be reached in the five-year expansion of *hogs* during 1952. One factor is the short *corn-feed* crop in 1951. . . . In general, though, there should be a larger *meat* supply this year, with most cuts to be more plentiful. . . . Several concerns are even contemplating increased imports of *lamb* from Australia. . . . The brightest spot in meat markets may be the *poultry* counter, however, what with our largest *turkey* output being recorded.

Fruit crops are likely to be smaller —*citrus* being the exception. . . . *Vegetables*, on the other hand, will continue strong in both demand and supply. . . . *Truck crops* for processing hit the 6.6 million-ton mark in '51, as compared with 5.2 million tons in '50. . . . On the debit side, *pimientos* will be short—the crop being only one-third as large as 1950's. . . . In California, the *California Fruit Growers Exchange* (Sunkist) sold more than $150 million worth of fresh fruit and products in its last fiscal year.

Total '51 *sweet-corn* pack passed the 30 million-case mark—a 40 percent up over '50. . . . *Frozen strawberries*, however, were about 30 percent less. . . . Stocks of *canned peas* appear to be adequate, with a total supply of almost 40 million cases on hand.

Holdings of *frozen shrimp* late last year exceeded 21 million pounds. . . . Stocks of *frozen cod fillets* were reported to be less than half of 1950's.

CASE HISTORY SERIES



Reduction of Animal Glands

One RD-18-D Rietz Disintegrator with 75 HP, preceded by a 40 HP Prebreaker, reduces animal glandular tissue to a finely divided slurry at capacities up to 18,000 pounds per hour. This installation is in a plant producing a wide variety of pharmaceuticals, drugs, and other similar products. Production of this operation is sharply up from that achieved with former equipment. The increase is due, in large part, to the exclusive Rietz Differential Discharge which separates the disintegration-resistant sinewy and tough portions of the glands from the slurry, preventing buildup and clogging problems. Separation is automatic and continuous during the pulping operation.

Write for free technical bulletin covering the above installation.

Equipment for the food and chemical process industries

Rietz MANUFACTURING CO.

Santa Rosa, California

. . . The '51 *Alaskan salmon* pack ran to 3.5 million cases—considered a light year. . . . The *Maine sardine* pack was only 60 percent of normal. . . . Imports of *fresh and frozen tuna* topped 65 million pounds for the first nine months of '51.

Manufacturers' stocks of most *dry milk products* are the highest in several years. . . . About 65 percent of all *soybean oil* is now produced by solvent extraction. . . . In the first ten months of 1951, 536 million gallons of *ice cream* were produced in the country. . . . During the same period, U. S. *cheese* production sagged 3 percent below 1950.

Disease and bad weather is seen combining to cut the forthcoming world *cocoa* yield by about 3 percent. . . . A record 3 million-ton California *grape* crop—20 percent over last year—is seen raising the domestic wine output. . . . World exportable *coffee* is expected to rise 6 percent this season.

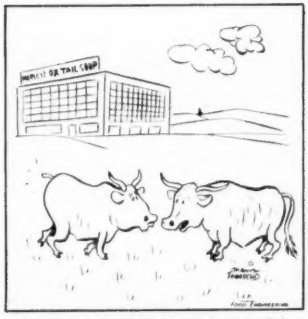
Wages Linked to Output?

Management, labor, and government officials are studying a recent AFL proposal suggesting that wage increases be allowed where more efficient production methods are in effect.

To take advantage of this proposal, a new yardstick for measuring production efficiency is required. Bureau of Labor Statistics has provided helpful data of this sort in its Bulletin No. 1046, which presents "Productivity Trends in Selected Industries—Indexes Through 1950."

Data are given for many branches of the food processing industry, with figures for output per man-hour as the most significant for wage discussions. Most food branches for which reports are given have increased substantially in productivity, on this basis, during the 12-year period 1939 to 1950.

Beet sugar production is up 15 percent per man-hour. Canning has risen nearly 32 percent. Only a few have not gained significantly. For example, flour



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More and more Food Product Processors from coast to coast are depending upon MORNINGSTAR for Food Starches and Thickening Agents. Direct importers and manufacturers, MNI can ship quickly and economically in any quantities from a few 100 pound paper bags to many carloads. MORNINGSTAR BRAND Products are scientifically prepared and laboratory controlled to precise standards of *uniform* fine quality. They'll add new texture and appeal to many foods.

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SOLUBLE STARCHES AND DEXTRINES
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An experience record of more than 45 years, serving all classes of industry and business, qualifies Standard to be of expert service to you on any "package" conveyor need — roller, belt, slat, chain, push-bar, sectional, portable self-contained units — spiral chutes — pneumatic tube systems. Write—Address Dept. FE-22.

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● Consolidated Type 45-C-10 High Speed Coffee Weighing Units with 10-head scale fill, weigh and settle 100 ½, 1 or 2 lb. cans, jars or cartons per minute. Progressive packers, like the Old Judge Coffee Company, use the C-10.

Conveyor is equipped with vibrating settler and package control. Scale weighs to an accuracy of 1/16 oz. over or under. Once machine is set, operation is fully automatic.

The Consolidated C-10 handles the full range of coffee grinds... drip, percolator, regular, silex and steel-cut. Write for information on Consolidated machines for the food industry.

CAPEM Screw Cappers SEALTITE Bag Sealers HOEPNER Bag Sewers

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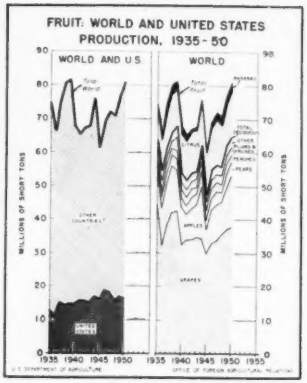

FRUIT: WORLD AND UNITED STATES PRODUCTION, 1935-50
WORLD AND U.S.
WORLD
MILLIONS OF SHORT TONS
1935 1940 1945 1950
1935 1940 1945 1950 1955

milling has declined by 15 percent, and a few others such as condensed and evaporated milk have barely held their own.

The significant figure in any wage discussion will be derived by the engineering group for *its own individual works*. Furthermore, a breakdown by types of activity may be necessary in order to adjust wage calculations appropriately to give benefits where improvements in performance have occurred, and deny them where productivity has not improved.

No one yet knows whether or not union negotiators are going to follow the AFL proposal. Equally untested is the attitude of Wage Stabilization Board officials.

'51 Diet Balance-Sheet

What does the average American eat every year? And how much of it?

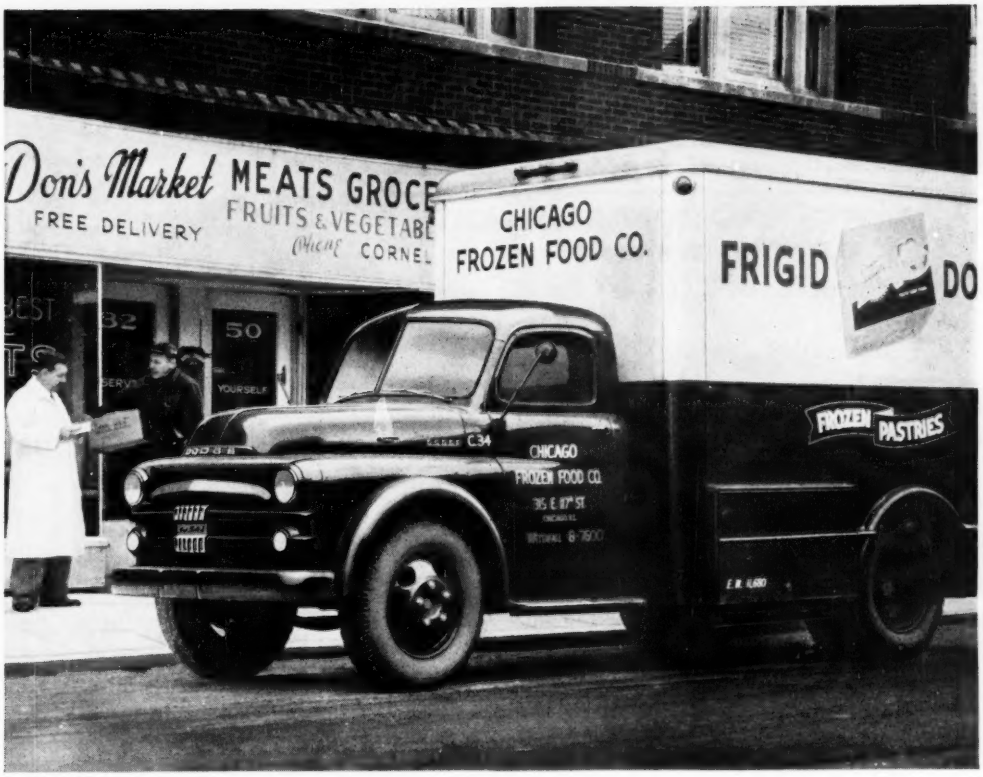
Figures compiled by the USDA indicate that Mr. and Mrs. Civilian fared very well in 1951. The following table summarizes some of the more important items—each compared with 1950:

Commodity	1951 lb.	1951 as a percentage of 1950
Meat	141	98
Fish	11.4	100
Eggs	49.4	107
Chicken	27.0	110
Total milk	757	98
Fluid milk and cream	395	103
Fats and oils	43.2	95
Fresh fruits	119	110
Processed fruits	44.6	105
Fresh vegetables	251	99
Canned and frozen vegetables	45	100
Potatoes	104	101
Sugar, refined	97	101
Flour	133	100
Coffee	16.6	103

Citrus Groups Combine

Consolidation of the activities of the three trade associations serving Florida's citrus processing industry is announced.

The Florida Canners Assn. will take



The low-down on lower delivery costs

The low-down on lower delivery costs is simply this: A truck that *fits the job*, lasts longer, costs less to run. Such a truck will be engineered for low operating and upkeep costs and top performance in *your* business.

There's a Dodge "*Job-Rated*" truck that'll do just that —a truck that's factory-engineered throughout for rock-bottom economy in frozen food hauling. It'll lower your delivery costs right from the start!

You'll get a high-compression engine that s-t-r-e-t-c-h-e-s every gallon of gas over extra miles. You'll get 4-ring pistons that help add months and miles between oil changes. You'll get exhaust valve seat inserts and chrome-plated top piston rings that help keep your Dodge on the road—and out of the repair shop!

And, say, talk about a time-saving truck! Just drive a Dodge and see for yourself what this quick-stepping, sure-braking truck will do in toughest traffic. Add to this the minutes saved at every stop because of extra-low ground-to-floor height that speeds loading and unloading.

Get the complete low-down on lower delivery costs! Find out how you can count on extra savings with a thrifty Dodge "*Job-Rated*" truck. Size one up at your nearby Dodge dealer's—*soon!*

DODGE "Job-Rated" TRUCKS

LEE *headquarters for the*
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CORROSION-RESISTANT
KETTLES

Available in sizes up to 500 gallon capacity to meet every processing need. Easy to clean and keep clean, they are practical and meet all sanitary regulations. All Lee kettles are available with hydraulic cylinders where your own water line provides the necessary operating power to safely control tilting kettles and tilting agitators in agitator kettles.

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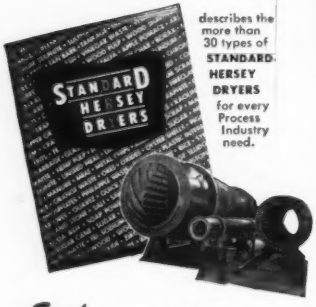

describes the more than 30 types of STANDARD-HERSEY DRYERS for every Process Industry need.

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You will receive our Engineering Report suggesting the best method to use and the type of Schutz-O'Neill Pulverizer and any receiving or sifting equipment suited to your requirements.

SCHUTZ-O'NEILL offers you the benefit of more than a half century of experience in rapid, accurate, dustless pulverizing of any dry, grindable, non-gritty stock.

SCHUTZ-O'NEILL Pulverizers are made in 6 sizes with capacities up to 2000 lbs. per hr. Also Gyrator Sifters, Rollers Mills, Receiver Boxes, Collectors, Hammermills, etc.

When sending sample, be sure to State fineness desired.

ESTABLISHED 1893 SCHUTZ-O'NEILL CO.

309 Portland Ave., Minneapolis 15, Minn.

Schedule of Events

February

11–16—Western States Meat Packers Assn., sixth annual meeting; Biltmore Hotel, Los Angeles.
19–21—Technical Pickle School; Michigan State College, East Lansing.

March

3–5—National Preserves Assn., annual convention; Congress Hotel, Chicago.
3–6—American Society of Bakery Engineers, 28th annual meeting; Edgewater Beach Hotel, Chicago.
3–7—National Assn. of Frozen Food Packers, annual convention; Conrad Hilton Hotel, Chicago.
3–8—American Bottlers of Carbonated Beverages, plant training course; New Hotel Jefferson, St. Louis.
6–7—Dairy Industries Supply Assn., 33rd annual meeting; Hotel Congress, Chicago.
7–9—American Institute of Baking, short course in bakery sanitation; at Institute, Chicago.
11–12—Annual Chemurgic Conference; Hotel Statler, St. Louis.
11–14—National Plastics Exposition, fifth annual; Exposition Hall, Philadelphia.
17–19—American Dairy Assn., 13th annual meeting; Morrison Hotel, Chicago.
30–31—Packaging Machinery Manufacturers Institute, semi-annual meeting; Hotel Dennis, Atlantic City.

over the information services of the Canners League of Florida and will administer the program of the Citrus Processors Assn., representing pulp and molasses producers.

Figuring Can Quotas

NPA has amended its M-25 tin can order to make it possible for canners to spread production equally over all quarters of 1952. However, the new "Direction No. 3" doesn't increase amount of cans that a packer may use.

Under the new direction, a packer may use as quarterly packing base that amount of cans determined by dividing by four the cans used to pack a particular production during his base year.

M-25 previously obligated a packer to calculate his quarterly base on the amount of tin cans he used for a particular product during the corresponding quarter of his selected base year, either 1949 or 1950.

F&DA Food Standards

Very little progress was made on food standards of Food & Drug Administration since the status in early December was reviewed. The latest actions are listed below:

Ice cream hearing resumed on schedule on Jan. 9, but recessed again the same day until Feb. 4, when further direct testimony was expected to be given for a week or more. A one-month recess was planned to follow

HOW TO
set up and maintain an effective plant sanitation program

This practical manual presents workable principles and methods of good plant sanitation which can result in more efficient operation, better workmanship, fewer accidents, and improved personnel relations. In simple language, and extensive outline style of treatment, it gives "how-to-do-it" material of value to all food processors, and particularly useful to the canning, freezing and dehydration industries. There is also much to help those concerned with the sanitary transportation, storage and distribution of both fresh and processed foods. Here are helpful illustrations, all the essential steps, equipment, applications, etc.—a wealth of information to enable you to establish an efficient, profitable sanitation program.

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SANITATION For The FOOD-PRESERVATION INDUSTRIES

Prepared by The Association of Food Industry Sanitarians, Incorporated

In Cooperation with The National Canners Assoc.

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From the start this book gives useful facts on organizing a sanitation program, including materials, procedures, and interpretative comments for the sanitarian, manager, superintendent and foreman. Equipment and techniques for plant inspection are clearly described. The book tells how to store food products, containers, machinery, etc.—explains the significance and control of animal and bird pests, insect pests and microorganisms—and discusses the methods of getting an ample supply of suitable water, handling and storing it for use in food plants.

The book tells how to

- store ingredients
- control rodent pests
- apply insecticides
- apply sanitizing solutions
- pipe sewage through a plant
- locate a food plant
- select proper detergents
- use liquid chlorine
- handle solid wastes
- dispose of and utilize waste, etc.

The factors to consider for the proper construction and maintenance of buildings and equipment are plainly outlined. You're told **how to** organize an effective cleaning program in a food plant to prevent contamination of perishable products—and how to provide the necessary sanitary, feeding, and even housing facilities for employees. Other helpful material, representing the experience of many practicing sanitarians, includes a discussion of chlorination techniques, a non-technical coverage of waste treatment and disposal, and a compilation of laboratory aids.

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the direct testimony prior to cross examination.

Canned tomatoes standard of identity was amended slightly as far as label statement of optional ingredients was concerned. The old label statement, "With Added Strained Tomatoes," was deleted and the following statement substituted: "With Added Strained Residual Tomato Material From Preparation for Canning, Spice and Flavoring." This order appeared on page 12763 of the Dec. 20 *Federal Register* and will be effective on March 19.

USDA Grade Standards

Recent actions by Production & Marketing Administration of USDA Grade Standards and related activities include the following:

Frozen asparagus, revised, proposed, page 12999, Dec. 27 *Federal Register*, written comment received to Jan. 26.

Eggs and egg products, instructions to official plants sampling, grading, grade labeling, and supervising packaging; revised, proposed, page 86, Jan. 3 *Federal Register*, written comments received until Feb. 2.

Poultry and edible products thereof, regulations governing grading and inspection; amendment, proposed, page 89, Jan. 3 *Federal Register*, written comments received until Feb. 2.

Refiners' syrup, new, page 136, Jan. 5 *Federal Register*, effective Feb. 4.

—End—

Coating Agent vs. Mold

—Continued from page 72

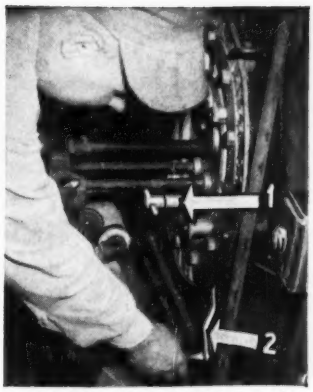
surface absorption of moisture is minimized and mold growth inhibited.

Air currents may be particularly blamed as carriers of mold spores, especially in plants with long hallways, elevator shafts, product chutes, conveyor lines and, in some cases, antiquated air conditioning systems. An electrostatic air sampler ** is useful for checking the mold-spore content of the air. In general, if there are fewer than 5 viable mold spores per cubic foot of air (using a minimum of one reading per 200 sq. ft. of floor space) the mold control program is usually satisfactory.

About the Compound

Copper-8-quinolinolate was insoluble until Kalberg successfully modified it to be soluble in most non-polar solvents.[12, 13] The process has also

** Luckiesh - Holladay - Taylor Electrostatic Bacterial Air Sampler, made by lamp department of General Electric Co., Nela Park, Cleveland 12.



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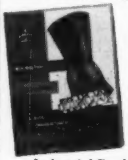

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enhanced its fungicidal effectiveness. Now 8-quinolinolate may be obtained commercially in a variety of solvents or carriers for various specific uses.

Approximately 75 varieties of molds and yeasts commonly found in packing plants were used to determine the activity of 8-quinolinolate. Each showed inhibition by 10 to 100 ppm. of copper (as copper-8-quinolinolate) when grown on potato dextrose agar.

Other tests indicated that bacteria are resistant to these low levels of copper, although they appear to be inhibited at the recommended use levels (500-2,500 ppm. of copper in copper-8-quinolinolate).

Laboratory white mice have been fed 8-quinolinolate at levels containing 180 ppm. of copper in their daily diet for three months without showing any toxic symptoms.

The copper in the compound appears to be so completely chelated that the usual tests are negative in respect to copper in the ionized form. Except for contained solvents, solutions are normally odorless and tasteless at use levels.

As with other copper salts, solutions of 8-quinolinolate have a brownish green cast. But when used at the levels suggested, (5 to 10 percent), this cast is not noticeable in the darker colors and only moderately so in white paints.

The new fungicide is readily mixed with most types of solvent-containing paint formulations, as well as other solid or liquid impregnating materials, including waxes, paraffins, oils, and fats. The use of proper amounts in a typical paint formulation should not greatly increase the cost per gallon.

Addition of solubilized 8-quinolinolate to prepared paint is not recommended—due to possible reaction between the fungicide and certain pigments, and also because of the viscosity changes in the paint caused by the thinner used to solubilize the fungicide. It is preferable to custom-prepare all paints bolstered with 8-quinolinolate—to insure the optimum balance of all factors.

Copper-8-quinolinolate in properly formulated materials is very resistant to heat, withstanding 400 deg. F. It is also resistant to acid and alkali detergent materials. Solutions are quite stable, and aside from the added color they have not shown any adverse effects on wood, fabric, and leather.

Withstands Weathering

The most amazing, and still unexplained, property of the solubilized 8-quinolinolate is its resistance to leaching and weathering. Seine twine (fish netting) when impregnated with 900 ppm. of copper as copper-8-quinolinolate withstood 3,000 hr. of

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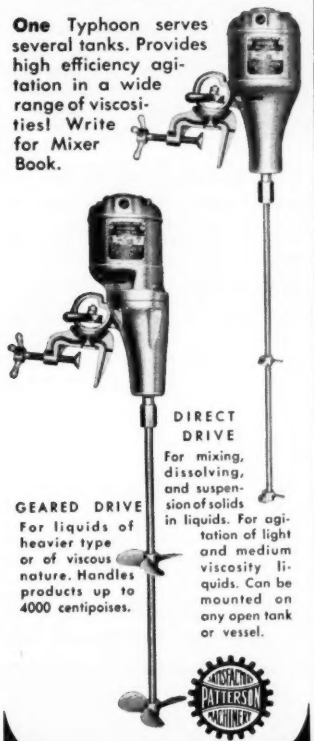

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leaching in fresh water. There was no significant decrease in either the active fungicidal property or the copper content. Manila rope treated in a similar fashion showed no loss of tensile strength after burial in well composted soil for a one year test period; whereas an untreated control rope disappeared within 60 days.[14]

The mode of action of 8-quinolinolate solutions is still a subject of debate. This fungicide seems to have a peculiar affinity for cellulosic material. Although in-vitro activity may not always be demonstrated, treated fibers remain extremely resistant to decomposition.

As in most cases of antiseptic action, moisture must be present in sufficient quantities to activate both the fungicide and the dormant but viable spore. Although 8-quinolinolate is extremely resistant to rapid leaching, a sufficient amount of the active principle appears to be released. Thus it is able to inhibit further growth and multiplication of the germinated spore. Recent studies by Gale and Paine[15] indicate that 8-hydroxy-quinoline may prevent the passage of glutamic acid through the cell wall of the growing organism and thus starves the young cell.

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End (Resume reading on page 73)

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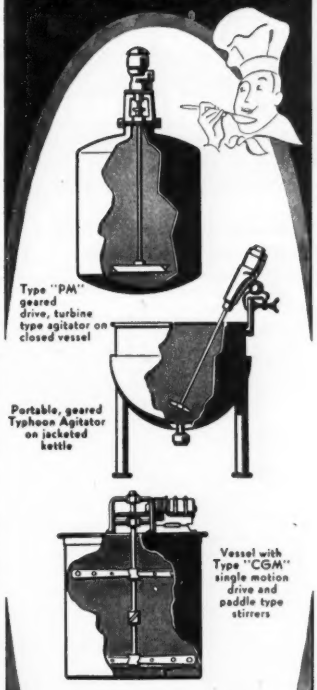

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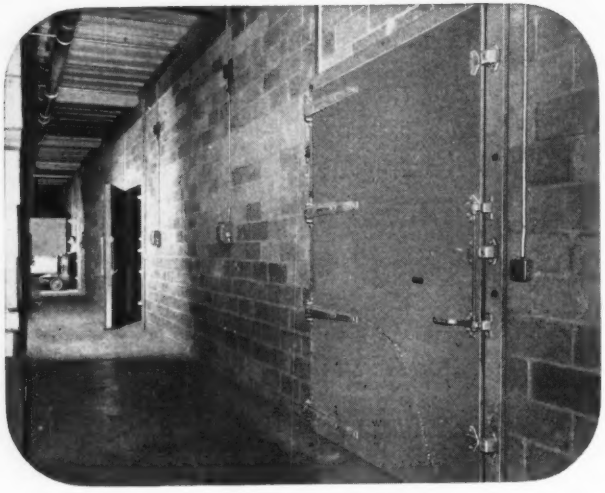
JAMISON doors speed food handling at Grand Union Warehouse

Installation of Series "50" Cold Storage Doors in the New Warehouse of Grand Union Company, Carlstadt, New Jersey.



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Solves Smoke Problem

—*Continued from page 94*

that precipitates out the bulk of the dust.

Zone 3 might be termed a "safety factor" or "back-up" section. It includes an additional six high-voltage discharge wires.

One of the features of the three-element screen-grid collecting electrode is its reduction of re-entrainment by providing a quiet zone between an expanded metal screen and a solid plate where the major portion of the dust is precipitated.

Kenotron electronic-tube rectifiers provide the 45,000v. d.c. required for precipitation. They are located in a high-voltage sub-station inside the boiler house. Main control panel for the system is also at this location.

High voltage equipment was supplied by General Electric to Aerotec specifications. The rectifier set has a maximum rated output of 400 milliamperes but provides continuous precipitator current of 130 milliamperes under normal operating conditions. A protective circuit of a Thyratron-triggered series transformer guards the costly Kenotrons from overload.

The Aerotec unit is designed for a rated gas flow of 100,000 cfm. at 415 deg. F. Operating at these ratings, the draft loss is 0.5-in. water gage, and the design velocity is 500 fpm. through an active length of 10 ft. 6 in. Eighteen parallel gas passages are provided in the unit, with effective height of approximately 17 ft.

Future Plans

Evaluation of the new system has already stimulated the brewery to authorize similar equipment on its four other coal-fired boilers. Also, it's of interest to note that the company is installing an additional 250,000-lb. B&W gas or oil fired steam generator to add further to the capacity of the very sizable power plant. This considerable power is necessary, since the boiler house provides electrical power as well as process steam requirements for the vast brewery.

Planning the location of the four future precipitating units has been a problem. No adequate room is available within the boiler house, or on its roof. Further, the roof structure is not strong enough to support an elevated housing to hold each unit.

Solution to this problem is seen by building an open-truss bridge to straddle the roadway adjacent to the boiler house. Plan is to mount the four precipitators in a row on top of this structure. Work on this project is expected to start shortly.

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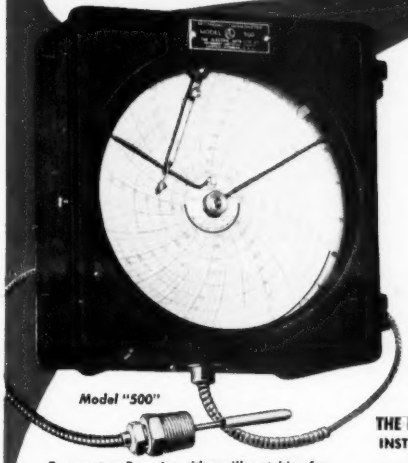

Temperature Recorder with capillary tubing for EYE-LEVEL reading. Priced from $42.50.

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Whatever size candy you may produce there is a Cyclone belt of the right gauge to fit your operation. (Illustration shows four actual mesh sizes.) And other Cyclone belts—Chain Link, Flat Wire and Flex-Grid—are available for many types of food plant conveyor problems. For more examples and information write for our free catalog No. 4. Address: Cyclone Fence, Dept. H-22, Waukegan, Illinois.

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Still another problem faces the company: What to do with the huge quantities of extra fly-ash that will result from the efficient collection system? With all boilers contributing, there will probably be some 3 tons of the sooty material requiring disposal each hour.

With a view to resolving this question, the company has undertaken a chemical analysis of both the mechanical and electrostatically collected particles, and possible uses for the materials are now being determined. For example, both kinds of particles have a chemical composition which would appear to make them highly suitable as asphalt fillers. Investigations are also in progress to explore the possibilities of fly-ash as a substitute for a portion of the cement in concrete.

End (*Resume reading on page* 95)

Winemaking In 2052 A. D.

—*Continued from page* 86

terest in the product on the basis of consumer disposition and goal. The consumer is first and foremost—not the product, the winery, or its methods.

Winery competition, as always, is price-wise and quality-wise, but the prime objective is now in the direction of heightening the standard of living and improving the health of the consumer.

Vitamins and other health-promoting agents are regularly added to wines, since it is generally acknowledged that wines are excellent dietary supplements and, in some cases, have definite medical advantages. Intoxication through the use of wine has virtually disappeared, and prohibitionists have long ago given up the ghost. The government has reclassified wines—they no longer come under the heading of intoxicating liquors. And taxes have been reduced.

In the culinary arts, wine has moved forward into a prominent position. It has come to be conventionally used in the homes of this country for making sauces and enhancing the flavor of cooked foods. Many new tall drinks now incorporate wine as a main ingredient. In the social amenities, wine has joined flowers, candy, and cigars as the acceptable gift for holidays and anniversaries.

Indeed, here in 2052 wine is enjoyed on all occasions and, while it does not actually threaten to replace water or milk, it is certainly recognized for what it is—a delicious all-around beverage, a thirst quencher, a food, and a therapy drink.

Above all, wine is a psycho-chemical

(*Turn to page* 209)

Packaging Evaluation

includes such factors as odor transmission, grease resistance, stability in storage, water permeability, tensile and bursting strength and crease resistance.

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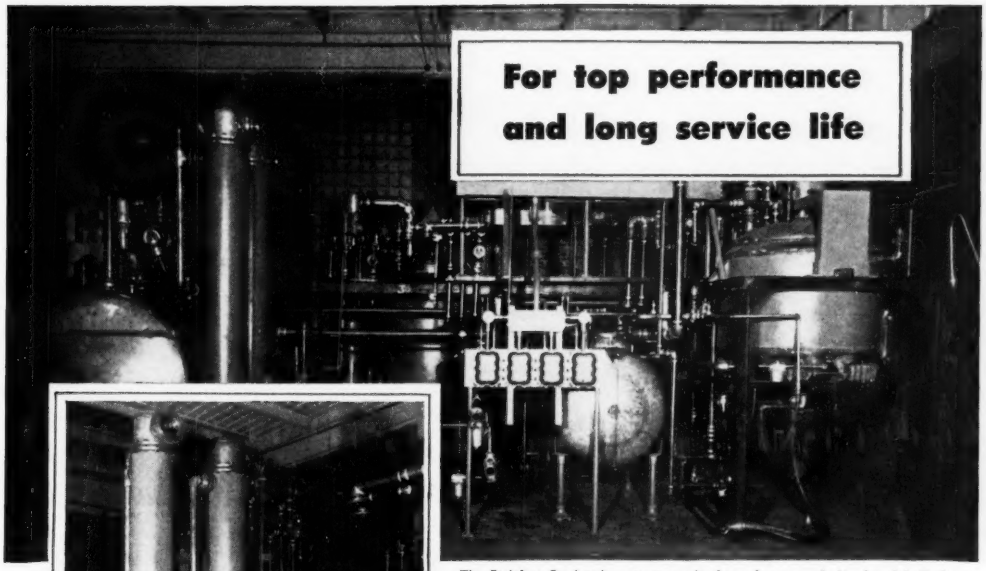
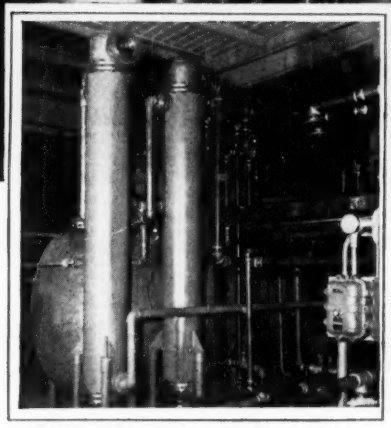


The Stainless Steel twin extractor unit shown here was designed and built for William J. Stange Co., Chicago, Ill., by the Pfaudler Co., Rochester, N. Y. The packaged unit includes several percolators, dryers, four tanks with capacities from 300 to 1,500 gallons, condensers, pumps, valves and fittings.



Stainless condensers and storage tank of this specially designed package unit.

this spice extractor unit is built of U·S·S Stainless Steel

HERE AGAIN, in the solvent extraction and recovery of spices, Stainless Steel equipment demonstrates the outstanding ability to resist corrosion and protect natural flavor that has made it the preferred material for many types of food processing equipment.

Discussing the factors that led to the selection of Stainless Steel for this twin extractor unit, Harry R. Ansel, Secretary-treasurer of the William J. Stange Co. says:

"Certain major parts of the extractor units require a material which would be resistant to corrosive attack by certain organic compounds and, at the same time, have strength and adaptability to the design of a pressure vessel. In addition, certain working parts had to be resistant to abrasion. Stainless Steel meets these requirements to the best all round advantage."

Today, with equipment replacements so difficult, U·S·S Stainless Steel's long service life is yielding big returns in many types of processing jobs.

Stainless cuts maintenance requirements . . . is extra protection against costly breakdowns . . . two more reasons why it deserves a big role in your future equipment plans.

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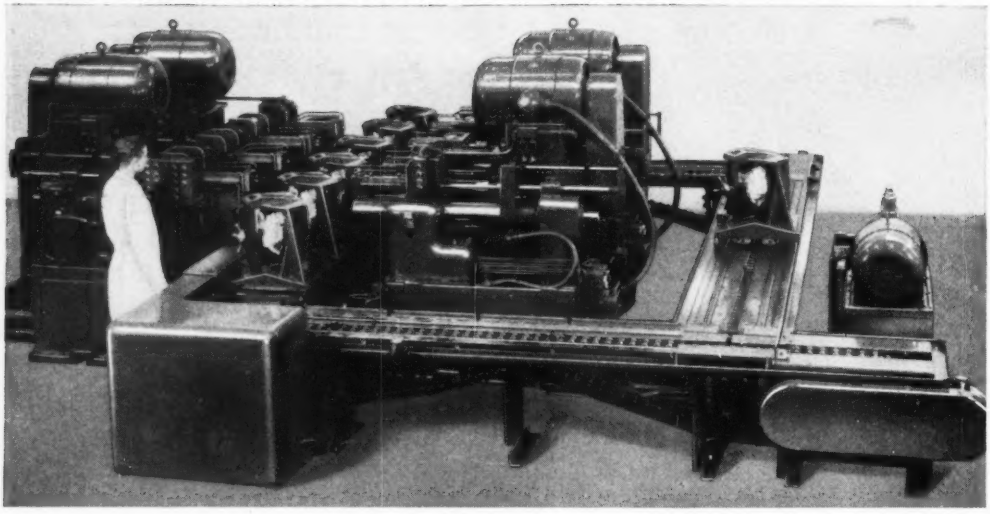

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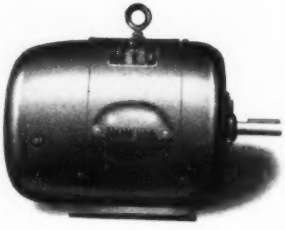
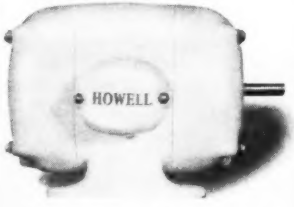
Howell engineers will be glad to work with you, too, to get top performance from your electric motor installations. They will design special motors if required, or recommend Howell motors in standard NEMA frame sizes from 1/6 to 200 H.P. So, for every job, especially your toughest ones, get in touch with the Howell representative in your city, or write directly to us today.

HOWELL ELECTRIC MOTORS COMPANY
Howell, Michigan



HOWELL Type K Motor. Offers constant performance in the presence of dirt, dust, fumes and moisture. Sizes from 3 to 150 H.P. at 1800 R.P.M. Either vertical or horizontal mounting.



HOWELL Sanitary Motors meet the most exacting standards of the dairy and food industries. They contain no pockets, cracks, or crevices. Available for vertical or horizontal mounting.

HOWELL Red Band MOTORS

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built industrial motors since 1915

reagent, since it lends special quality and flavor to everything associated with it. Foods taste better. Friends are friendlier. Tempers are quieter. And pressures are lower.

Altogether, the world is a better place for having recognized the true value of wine.

So..*z*..*ur*..*uh*..ends our dream...

. . . . . .

(*Fast Fade-Out—Back to 1952*)

. . . . . .

. . . and whether the wine or the winery of the future will more than scantily resemble our reveries above, we cannot predict. However, we feel there is no reason why the improvements cannot be as great, if not greater—if we can but overcome one thing: Our own inertia.

Industry's Bright Possibilities

The potentialities of the wine industry in the United States are tremendous. If we merely take the per-capita wine consumption in France and put it alongside the figure for this country, just the difference alone represents sufficient potential to multiply our production many times.

It is conceivable that the American public, once educated to the advantage of wine, would bring the call for the product up to this level. However, it is doubtful that the industry could meet such a demand, or keep up the standard—unless it overcomes some of its antiquated weaknesses and develops new and better ways to make wine.

It is very likely that wine prices will come down with an increase in consumer demand, especially when coupled with the development of more efficient methods of grape growing and wine making.

Now is the time for a critical survey of the situation. The wineries cannot much longer endure with "oxen and wheelcart" ways in a rocket age. They had better move on—and fast!

End (Resume reading on page 87)

Non-Stray Quality Flavors

—Continued from page 110

a rather complex looking apparatus invites your attention. Mr. Abbey points out that this comprises a continuous ion-exchange water treatment system designed specifically for the company by the Illinois Water Treatment Co. And it plays a leading role, in view of the fact that Jackson's water is relatively hard and heavily chlorinated.

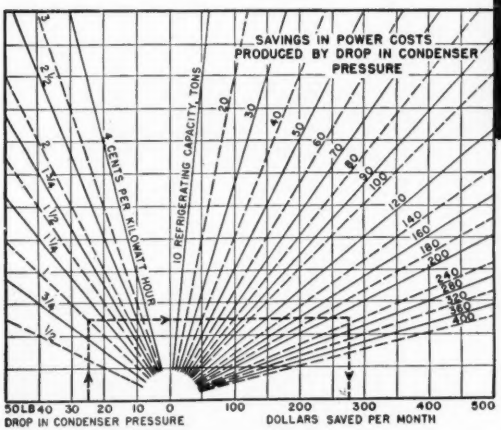
"Chlorine and flavor are irredeemably incompatible," remarks Abbey.

Actually, the water treatment system has provided two other equally worthwhile advantages. It furnishes a low-bacteria-count water that equals distilled water in sterility and is much less receptive to organic growth. And it removes all trace copper, which can produce oxidative effects when the flavor is used.

Three units comprise the system—a cation exchange cell loaded with acid impregnated synthetic resin, an acid absorption tank containing anionic removing resin, and an aerating unit that reduces occluded gases to a negligible low. Additional equipment includes a zeolite water softener for anion exchange cell regeneration, an electric-alarm water meter, and a conductivity control element and associated solenoid valve. The control system will stop the flow of water and signal the need for system regeneration if impurities climb beyond 2 ppm.

Capacity of the ion-exchange system is 250 gal. per hr. The treated water is piped to processes throughout the plant via Saran tubing. To prevent any deterioration of water quality after treatment, storage (in a 50-gal. resin-lined tank) is held to a minimum—the

(*Turn to page 211*)



This Chart Tells the Story*

FOR EXAMPLE: If you have a 220 ton refrigerating system, a power cost of 1¢ per kilowatt and your condenser pressure is 25 lbs. above normal (a very common condition) non-condensable gases are costing you approximately $275 per month — money that is totally wasted. An Armstrong Purger will eliminate this loss.

**Chart prepared by R. C. Doremus, Detroit Ice Machine Co.*

A Simple Way to Reduce
REFRIGERATION COSTS
and Increase Capacity

AIR and other non-condensable gases in a refrigerating system raise head pressure, make the compressor work harder and longer, reduce condenser capacity and thereby raise power costs. Ordinary purging methods seldom, if ever, get rid of all the air; they waste refrigerant and they take a lot of valuable time.

The answer is to install an ARMSTRONG PURGER. It gets all the air out of the system *with minimum refrigerant waste.* Hundreds of users state that their Armstrong Purgers have paid for themselves in from 30 days to six months. The forged steel body and stainless steel mechanism provide safety and dependability. The price is modest. The Purger is *unconditionally guaranteed* to give satisfaction.

SEND FOR BULLETIN

HOW TO TELL when non-condensables are present; their effect on efficiency and economy; how the Armstrong Purger operates; prices and data are contained in the Armstrong Purger Bulletin. Send for your copy.

ARMSTRONG MACHINE WORKS
866 Maple St., Three Rivers, Mich.

ARMSTRONG Non-Condensable Gas PURGER

The Finest Foods

Taste Better
Sell Better

when you add a little

Huron MSG

MONOSODIUM GLUTAMATE 99+%

to your present formula

Yes, the finest food products can be made to taste even better and be given new taste appeal and more sales appeal with the addition of Huron MSG.

Huron MSG can be added in small quantities to your present formula and no other changes are necessary. The cost can be kept surprisingly low.

Proof—try it yourself on your own products by simply writing us today for sample quantities. Or our Technical Service Department will be glad to make specific recommendations.

THE HURON MILLING COMPANY
Pioneers—Harbor Beach, Michigan
Gen. Sales Offices—9 Park Place, New York City 7
161 East Grand Ave., Chicago 11 • 13 E. 6th St., Cincinnati 2
383 Brannan St., San Francisco 7

Men & Companies

James M. Irwin, general manager of H. W. Madison Co, Cleveland, was recently elected president of the National Pickle Packers Assn.

Industry

Beechnut Packing Co. has purchased a 22-acre tract in Schoharie Junction, N. Y., where it plans to build a fruit canning factory.

The Borden Co. announces construction of a $365,000 research laboratory in Philadelphia. It is scheduled for completion by June.

H. C. Brill Co., Inc., has promoted Harold W. Shannon to the position of sales director of its bakery division.

Burns Fisheries, Ltd., of Halifax, N. S., recently suffered loss of its processing, packing, and storage plant in a $500,000 fire.

Canadian Packaging Assn. has elected John P. Gledhill as its president. The association represents more than 200 firms doing a $500,000,000 yearly business.

Can Manufacturers Institute has elected Richard P. Schwartz as president.

Chase Candy Co. of St. Louis and San Jose, Calif., has merged with Nutrine Candy Co. of Chicago. Ralph A. Wenger continues as chairman of board of Chase, while W. A. Yantis, former president, becomes vice-chairman. Neal Diller, Nutrine's former president, becomes president of the new enterprise.

Florida Citrus Products Exchange has named Charles G. Metcalf, former president of Clinton Foods, to operate the concentrate plants recently purchased from Snow Crop.

H. J. Heinz Co. has named four new v.-p.'s: N. E. Daniels, Fred C. Heinz, C. L. Rumberger, and P. K. Shoemaker.

Ideal Packing Co., Cincinnati, has acquired the plant of Bruckmann Brewing Co., of that city, and will remodel it into a meat packing plant.

Kraft Foods Co. has appointed William W. Hoerter and Tom M. Chantron as advertising managers.

Kramer Trenton Co. has appointed Otto J. Nussbaum as chief engineer.

Krimo-Ko Corp., maker of chocolate syrup, has named George E. Clodfelter as vice-president and M. L. Hannon as secretary.

Ontario Cheese Producers Assn. will shortly begin processing and marketing its own products in a new $350,000 plant in Belleville, Ont.

Poultry Packers of America, Inc., is building a turkey and poultry packing, eviscerating, and quick-freezing plant on a 15-acre site in California's Antelope Valley.

Shredded Wheat Co., Ltd., has named Richard M. Howard as managing director. The company is a British subsidiary of National Biscuit Co.

Smith Frozen Foods of Oregon has bought, for upward of $400,000, the processing, freezing, and storage facilities at the Milton-Freewater frozen foods plant of F. G. Lamb & Co.

Westgate-Sun Harbor fish packing houses in Monterey, Calif., were recently destroyed by fire, with the loss estimated at $1,800,000.

(*Turn to page* 212)

Richard P. Swartz, president of Crown Can Co., Philadelphia, has been elected president of Can Manufacturers Institute.

Non-Stray Quality Flavors

—*Continued from page* 209

bulk of water being treated as used.

At this point in your tour you cannot help being impressed with the extreme care that goes into making flavors. The equipment is spotless, technics rigid, raw materials discriminatingly selected, processing water purified, and checks frequent.

"How is it possible," you ask, "for a flavor batch ever to stray from optimum under these conditions?"

You are then told that complex flavors—particularly blends—are unpredictable even under the most careful conditions. And bitter experience has developed this expensive philosophy: "If it's not exactly right, dump it!"

For the flavor maker must assume the highest responsibility to his customer—since just a slight "twist" to an established flavor can be magnified many times in a sizable quantity of consumer product.

It's very difficult to pick up small errors in a flavor by analytical means. Hence, evaluation of a product before it is released to a customer must be along the lines of its ultimate use. Accordingly, the laboratory technicians have the continuous tasty chore of sampling the ice cream, soda pop, and candy that are trial-made in their own equipment.

"Besides this program of extreme caution," you ask, "what would be a few typical problems that face the flavor maker?"

One difficulty, you are informed, involves getting a stable emulsion in order to avoid "ringing" of flavor in beverages. The flavor oils are light, with sp. gr. of about 0.85 as against 1.2 in the beverage. And so, there's a possibility of separation in a relatively short time. Yet the bottler wants at least a year's stable suspension for shelf storage.

A good deal of study goes into solving this problem. Each oil has to be tested thoroughly as to solubility characteristics upon high dilution. Then the particle size of the flavor has to be reduced by an homogenizer to the point where a strong Brownian movement will occur in the particular beverage under consideration.

But if the particle size of a flavor is reduced below 1½ microns, the resulting emulsion is apt to produce a clear beverage in an instance when a "cloudy" one is desired.

In this case, it took over eight years of study to bring full realization that insolubles were actually going into solution. This effect—which takes place almost immediately—is due to the great surface exposed. So present calculations and tests, to determine the physical make-up of bottling flavors, also undergo a correction factor for oil which will go into solution in the beverage.

Another big problem of the flavor maker comes after the product has been sold. Some users still treat the addition of flavors in processing with artistry rather than precision. And the erratic results which invariably occur are often laid on the doorstep of the flavor supplier.

Flavor makers go to great lengths to guarantee the strength and performance of their product. It is only reasonable that processors adopt the same weighing and measuring precision with flavors as they use for their other ingredients.

The trend today is toward greater concentration in commercial flavors—with less costly shipping and easier handling. But the more the flavor strength, the greater may be the "headache" in haphazard food-plant use.

As Mr. Abbey cautions: "Use flavors quantitatively—and use them intelligently."

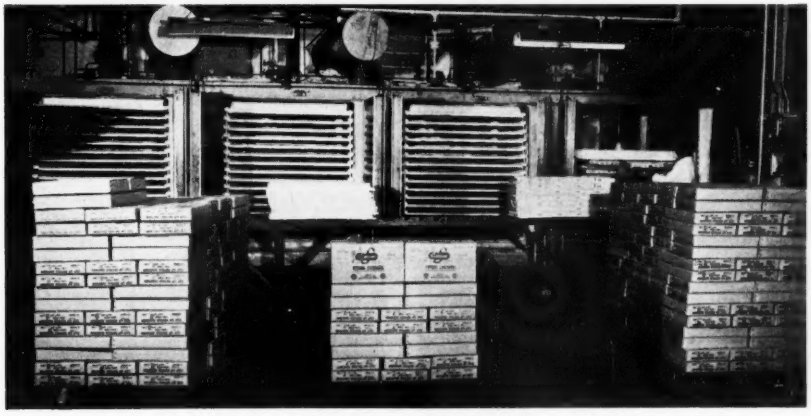
End (Resume reading on page 111)

Poultry Processors Know They Can Count on

Amerio CONTACT PLATE FREEZERS

(Patent Applied For)

For Quick, Economical Freezing



4 of a Battery of 8 Amerio Full-flooded Ammonia Type Freezers doing quick, quality freezing at the plant of C. A. Swanson and Sons, Salisbury, Md.

Send For New, Illustrated Brochure

Amerio
Contact Plate Freezers Inc.
Union City, N.J.
"It's the Contacts that Count"

Designed For Ammonia, Brine or Freon Refrigerant

THE WETTER YOUR PLANT EQUIPMENT AND WALLS THE MORE YOU NEED
DAMP-TEX ENAMEL
Proved Fungus Resistant by FUNGUS TEST
PRESERVES AND BEAUTIFIES DINGY WET WALLS AND EQUIPMENT
Dark, dingy walls cut down efficiency. Rusty, neglected equipment increases depreciation costs. Rot, bacteria and fungus play havoc generally. The Damp-Tex system was created for the plant where the presence of moisture, heat and other unusual conditions hinders proper surface maintenance. Over 8,457 plants have discovered its superiorities. Write for our trial offer "Y."
Proved Lactic Acid Resistant by ACID TEST
FUNGUS
RUST
DINGE
KNOCKS OUT THE ENEMIES OF PLANT MAINTENANCE
STEELCOTE MFG. CO. • ST. LOUIS, MO.
Canadian Industrial Distributor: G. H. Wood & Co., Ltd., Toronto
Canadian Manufacturers: Standard Paint & Varnish Co., Windsor, Canada

J. Albert Woods has been elected a director of Corn Products Refining Co. He also holds directorships with Commercial Solvents Corp., Chemical Bank & Trust Co., Wilson & Toomer Fertilizer Co., Southern States Bag Co., and Thermatomic Carbon Co.

J. O. Whitten Co., pioneer gelatin plant, is now under a new management, having been taken over by a group headed by William I. Gorfinkle.

Personnel

John R. Anstis is new managing director of Cow & Gate Ltd., and also of General Milk Products of Canada, Ltd., and Dominion Milk Products. George M. Rogers, founder, president, and general manager of General Milk and of Dominion Milk, recently retired.

William Archibald has been appointed plant engineer of Aula Co., Inc. He formerly was with the research and engineering department of Worthington Pump Co.

Geoffrey Baker is now cereal-division vice-president of Ralston Purina Co. Formerly he was sales manager of Nestle Co. of Colorado.

H. A. Bendixen, 25 yr. with Clinton Foods, Inc., has been named vice-president and general sales manager of the company's corn processing division.

Arthur N. Duffy is the new director of sales for National Biscuit Co. of N.Y.C.

Frank A. Dunn, formerly Los Angeles branch manager of Libby, McNeill & Libby, has been appointed sales manager of the company's western division. Owen E. O'Maley, of the New York office, will take his place in Los Angeles.

William F. Filz, food technologist at Oregon State College, has been appointed plant manager of a new cranberry processing company at Long Beach, Wash.

J. M. Hartwick is new president of the Ontario Assn. of Ice Cream Manufacturers.

C. F. Hundley is leaving the presidency of Harvard Brewing Co., Lowell, Mass., to become assistant to the president of the Blatz Brewing Co.

Harold C. Kavalaris has been promoted to the position of grocery products promotion manager for General Mills.

R. Newton Laughlin has been elected president of Continental Baking Co. He succeeds Raymond K. Stritzinger, who retains his post as chairman of board.

Tillie Lewis, president of Flotill Products, Inc., Stockton, Calif., has been named 1951 "Business Woman of the Year" in a poll of women's editors of A.P. newspapers. This is the first time a woman of the food field has received the award.

George A. Schell is now assistant to the president of Canada Packers Ltd. He has been with company since 1919.

William A. Schroeder, Jr., has been elected vice-president in charge of sales for Best Foods, Inc.

Donn. A. Searle is new president of Searle Food Corp., succeeding F. Gladden Searle, retired due to ill health.

Frank C. Verbest has been re-elected to his sixth term as president of Blatz Brewing Co.

Dr. Roy L. Whistler has been elected chairman of the American Chemical Society's sugar chemistry division.

Associated Industry

American Society of Refrigerating Engineers has named Edward Simons, consulting engineer, as its new president.

Alfred J. Eichler was recently elected president of Walworth Co., maker of valves, pipe fittings, and pipe wrenches. (*Bachrach photo*)

Sandvik Steel Belt Conveyor for Meat Packing
Steel-Belt Conveyor
SPECIALLY DESIGNED TO CUT MEAT-HANDLING COSTS
SANDVIK STEEL, INC.
Conveyor Department
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Manufacturers of Steel-Belt Conveyors For Over 30 Years
SANDVIK
STEEL BELT CONVEYORS
A Sandvik conveyor's extra ability to handle difficult materials comes from its solid steel belt. Here are some Sandvik advantages that cut handling costs.
• Long service life
• Greater carrying capacity
• Abrasion and corrosion resistance
• Easy to keep sanitary
• Smooth, impermeable surface
• Easy on and off slide-handling
• Scraper blade can be applied directly for discharging or cleaning
Our engineering staff will design a complete unit to fit your job. Belts of carbon or stainless steel . . . any length and a wide range of widths. Special water-bed arrangement can be provided for cooling of materials.
Write for further information.
SS-66

ATLANTIC GELATIN KOSHER and PARVE

Acceptable for use in processing all foods and confections sold to Jewish trade and institutions

IN AN important announcement, Rabbi Samuel Baskin and Rabbi Simon Winograd made known that they have certified Atlantic Gelatin Kosher and Parve and regularly supervise its production.

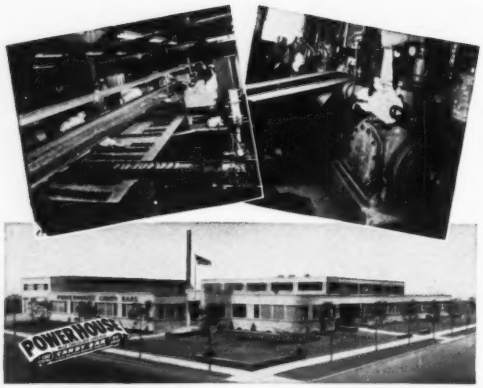
This Rabbinical Certification makes Kosher and Parve Atlantic Gelatin acceptable for use in processing or preparing foods and confections for purchase and consumption by all Jewish people, even the most Orthodox.

All processors using gelatin – food, meat, confection, ice cream, etc.–all restaurants, institutions and hospitals–are invited to address inquiries to:

ATLANTIC GELATIN

Division General Foods Corporation, Woburn, Mass.

MANUFACTURERS OF KOSHER AND PARVE GELATIN (K)



at the Walter H. Johnson Candy Company...

it's VILTER Again ...

Makers of the famous POWERHOUSE candy bar and other well-known candies, the Walter H. Johnson Candy Company can speak from twenty years of experience with Vilter refrigeration equipment. They continue to depend on Vilter refrigeration for the cooling that is so essential to candy making.

Vilter equipment in the Johnson plant includes four Vilter vertical Freon compressors, a shell and tube liquid Freon subcooler, brine coolers, air cooling fin coils, a shell and tube water cooler, and fin coils for the POWERHOUSE slab room, the fudge room, and the enrobing and wrapping rooms.

Like so many other processors, Johnson knows the importance of dependability in refrigeration. An equipment failure not only means lost time, it can mean loss of costly—and sometimes scarce—materials. Users of Vilter refrigeration equipment know that there is far less "down-time" with Vilter, and that they save on operating and upkeep costs as well. That's why you find so many plants re-ordering Vilter time after time.

Vilter

Let your nearby Vilter Representative or Distributor show you how you, too, can save money with Vilter.

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY
MILWAUKEE 7, WISCONSIN
Ammonia and Freon Compressors • Paklcers • Evaporative and Shell & Tube Condensers • Pipe Coils • Valves and Fittings • Can Ice Plants

L. West Shea of the Union Metal Mfg. Co., Canton, Ohio, is now president of the Material Handling Institute, Inc., comprising 78 companies.

Baker-Rauling Co., maker of power trucks, has named G. B. Davis as vice-president in charge of sales.

Chisholm-Ryder Co., of Niagara Falls, has appointed W. I. Carlson director of engineering, research, and development.

Continental Can Co.'s paper container division has named M. C. Alex as director of sales, and John T. Todd as manager of merchandising, a newly-created post.

Dow Chemical Co. has been named world market sales representative for a new vanilla flavoring plant being built and operated by the Ontario Paper Co. Ltd. The plant is under construction at Thorold, Canada, at an estimated cost of $1,300,000.

Food Machinery & Chemical Corp. has appointed William A. Wolff works manager of its newly acquired subsidiary, Simplex Packaging Machinery, Inc., of Oakland, Calif. M. William Smith is new sales representative.

Lever Bros. has promoted Dr. L. B. Parsons to the post of director of research and development. He succeeds Dr. Theodore H. Rider, who resigned recently because of illness.

North Carolina Bottlers Assn. has elected N. D. Sowerby president.

Olin Industries, Inc., announces election of Edward Hartshorne as manager of research and development of its Olin Cellophane Division.

Owens - Corning Fiberglas Corp.'s newest board member is Dr. Deane W. Malott, president of Cornell University. With B. F. Martin, Dr. Malott co-authored "The Agricultural Industries."

Shellmar Products Corp. has chosen Dr. Vlon N. Morris as director of research. The company makes flexible packaging materials.

Sterling Electric Motors, Inc., has started production in its new $2,000,000 plant in Van Wert, Ohio, making gears and splines.

Taylor Instrument Cos. has named Frank S. Ward general sales manager, succeeding Raymond E. Olson, now president.

Deaths

Walter L. S. Alexander, 53, assistant sales manager, coffee bag division of Arkell & Smith's.—Oct. 21.

Edward Brennan, 61, president of Haines Packing Co., director of Assn. of Pacific Fisheries, and member of Northwest Canners Assn.—Nov. 24.

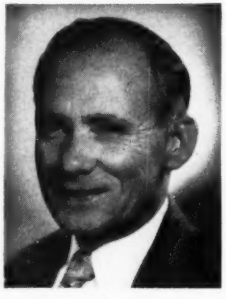
Carl J. Moroney, 65, chairman of board, Spreckels Sugar Co.—Nov. 27.

John W. Rath, 79, one of founders of Rath Packing Co. and a director of National Live Stock & Meat Board.—Dec. 22.

Beverly R. Robinson, member of The Borden Co. board.—Sept. 21.

Theodore D. Waibel, secretary of The Borden Co., who began as stenographer in 1915, rose to chief clerk in 1924, and to assistant secretary in 1931.—Sept. 16.

Douglas Warriner, 39, executive vice-president of Warriner Products Co., who in 1938 invented a process to dehydrate sweet potatoes and in 1949 a similar process for molasses.—Dec. 3.



Dr. L. C. Marshall, a professor of electrical engineering at the University of California, is now director of Link-Belt Co.'s new physical testing and research laboratory at Indianapolis.

This Machine "TAKES THE CAKE"...

and wraps it OVEN FRESH in sales appealing PROTECTIVE PACKAGES

No matter how odd the shape . . . how delicate or fragile the product!

SAFEGUARDS AGAINST: —

- DRYNESS
- MOISTURE
- FLAVOR-LOSS
- DUST-DIRT
- MOLD
- VERMIN

There's no crushing or squeezing of even the most delicately filled cakes or rolls — or breakage of fragile cookies and crackers when you package on the automatic Campbell Wrapper. Our "float" method of continuous feed wrapping is the answer. Your products reach their market "oven fresh" too, because longitudinal heat or glue sealing plus air-tight folded and crimped ends *keep moisture in or out* — where you want it. In addition, your production reaches new heights, too, for this modern machine *wraps up to 130 units per minute* — and in single or multiple product units! Saves labor, too — in most cases requiring only one operator to feed and one to pack. Machine uses materials of all types and is available with straight, L, or hopper feed. Investigate the Campbell Wrapper before you consider any other. You'll have a *better* package — at *lower* cost.

We are contributing to the nation's defense program by providing a large part of our increased production facilities for building precision armaments.

Write for fully illustrated descriptive booklet

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Wraps products of all shapes . . . and numerous sizes

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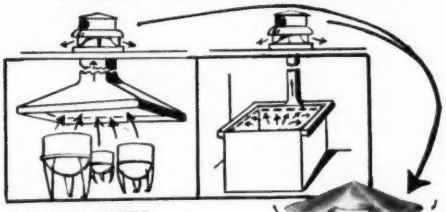
Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Wazers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Creapers and Tissue Converting Units.

SAFE
Moisture and Fume Removal

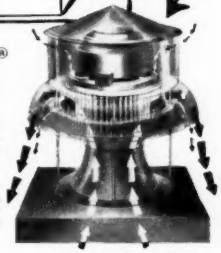


GALLAHER Air Van®

POWER EXHAUSTER

Expel moisture and fumes without the danger of motor damage. Exclusive Scroll Effect design, built-in, assures efficiency against normal static pressures. Positive air seal-off prevents passage of fumes into motor housing.

Air-Vans are weatherproof and completely self contained. No penthouses necessary. Direct connected. Construction Heaviest of any comparable unit.



Pat. 2188741 2526290

Ratings tested and certified by an independent laboratory. Capacities 150-11,000 CFM Static Pressures to 1¾" Ideal low silhouette design.

For full technical information contact your Gallaher Representative or write the Gallaher Company, Dept. F, 4108 Dodge Street, Omaha, Nebraska.

The GALLAHER Company

Omaha, Nebr. Owatonna, Minn.

Styl-O-Matic
ROTARY UNSCRAMBLING TABLE

- Cartons of bottles, jars, cans or containers are inverted on to the tilt top table and their contents pushed onto the revolving disc. Units are *automatically regimented and despatched in single file* to the conveyor.

LOWERS HANDLING COSTS — ACCELERATES PRODUCTION

- Conveyor carries units to other operations such as filling, capping, labelling, etc. Handles up to 100 units per minute depending upon diameter.

FREE!

MAIL THIS COUPON FOR FULL DETAILS

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Please send particulars on the Styl-O-Matic Rotary Unscrambling Table.

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ADDRESS.....

CITY.....STATE.....

FOAM'S A FRAUD . . . KILL IT WITH

DOW CORNING ANTIFOAM A

One part per million of Dow Corning Antifoam A kills foam during caustic soda concentration . . .

One part per million kills foam during synthetic varnish resin processing . . .

As little as 0.03 parts per million kills foam during tar evaporation . . .

And just three parts per million kills foam during strawberry jam concentration.

Odorless, tasteless, and relatively inert physiologically, Dow Corning Antifoam A is effective in a wider variety of foamers than any other material known—and in only trace quantities. Easy to introduce directly, in solvent solution, or even mixed with dry powders, it rapidly liquefies even the most violent and persistent foamers. That kind of efficiency has made it the most economical as well as the most versatile defoamer on the market.

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Please send full information and a free sample of Dow Corning Antifoam A.

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ATLANTA • CHICAGO • CLEVELAND • DALLAS • LOS ANGELES • NEW YORK • WASHINGTON, D.C.

Recent Inventions

Bacon Package With Side and End Flap Retaining Bacon in Releasable Fashion Having Transparent Overwrap—*C. G. Mayer and O. E. Seiferth, Madison, Wis. to Oscar Mayer and Co., Chicago. No. 2,565,976. Aug. 28, 1951.*

Nuts Deposited on Candy Bars by Means of Pocketed Rotating Drum With System of Suction Chambers for Feeding Nuts Into Pockets—*L. H. Zeun, to Peter Paul, Inc., Naugatuck, Conn. No. 2,566,712. Sept. 4, 1951.*

Weiner Processing Apparatus With Endless Conveyor That Advances Stuffed Casing Through a Series of Processing Chambers and Separates Individual Links After Transit—*E. Rockoff, Denver, Colo. to Minnie Levin, Cheyenne, No. 2,566,966. Sept. 4, 1951.*

Obtaining Calcium Gluconate-Free Pure Fructose From Electrolytically Oxidized, Lime Neutralized Invert Sugar by Solvent Extracting With Isobutanol and Crystallizing—*G. D. Docal, Havana, Cuba, to Sugar Research Foundation, Inc., New York. No. 2,567,060. Sept. 4, 1951.*

Preserving Foodstuffs by Treating Prior to Storage With Aqueous Solution of Rhodophyceae Extractive and Reductone—*L. S. Stoloff, New Bedford, Mass. ½ to Merck & Co., Inc., Rahway, N. J., and ½ to Krim-Ko Corp., Chicago. No. 2,567,085. Sept. 4, 1951.*

Continuous System for Feeding Rice Into Dual Steaming Chambers With Protection Against Excessive Loss of Pressure at Inlet and Outlet—*C. H. Ramsden, Oakland, and A. B. Court, San Francisco, Calif. to Rice Growers Assn. of California, Sacramento. No. 2,567,447. Sept. 11, 1951.*

Machine for Stuffing Olives Continuously—*G. W. Ashlock, Jr., Oakland, Calif. No. 2,567,590. Sept. 11, 1951.*

Cherry Pitting Machine Having Horizontal Fruit Carrier Beneath Vertically Moving Pitting Knife—*G. W. Ashlock, Jr., Oakland, Calif. No. 2,567,591. Sept. 11, 1951.*

Cheese Handling Apparatus Consisting of Vertical Rack on Tram Rail With Means to Automatically Invert Row of Product Carried Thereon—*R. Miollis, Maywood, Ill. to The Borden Co., New York. No. 2,567,957. Sept. 18, 1951.*

Wheat Gluten Dried by Mixing With Ethanol, Agitating Until Slurry is Homogeneous, Spreading in Thin Layer on Surface Heated to 150-170 deg. C.—*J. M. Tuomy, Madison, Wis., and R. L. Slotter, Minneapolis to U. S. A. No. 2,567,980. Sept. 18, 1951.*

Dough Dividing Machine With a Synchronized Knife Bearing Carriage Moving Vertically and a Horizontal Knife Movement Occurring in an Automatically Fed Antechamber—*J. E. Pointon, Peterborough, England, to Baker Perkins Inc., Saginaw, Mich. No. 2,568,252. Sept. 18, 1951.*

Sausage Forming Machine Including Movable Condiment Feeding Tube Within Meat Feeding Tube—*L. G. Edwards, Woodlake, Calif. No. 2,568,491. Sept. 18, 1951.*

Heat Exchange Vat With Parallel Temperature Conditioning Fluid Bearing Ducts Set in Zones in Wall—*T. Mojonnier, Oak Park, and O. W. Mojonnier, River Forest, Ill. to Mojonnier Bros. Co., Chicago. No. 2,568,653. Sept. 18, 1951.*

Ice Cream Product Containing 0.01 to 1 Percent Higher Fatty Alcohol Having at Least 12 Carbon Atoms in its Molecule—*H. T. Spannuth, to Wilson and Co., Inc., Chicago. No. 2,568,666. Sept. 18, 1951.*

Edible Sugar Syrup Prepared by Heating Juice Above 35 deg. C, Treating With Anion Exchanger, Acidifying Below pH 7, Re-treating with Anion Exchanger—*G. F. Mills, Palo Alto, Calif., and J. L. Porter, Baton Rouge, La., to Chemical Process Co., San Francisco. No. 2,568,925. Sept. 25, 1951.*

Butter Made Continuously by Cooling High-Fat Cream to 14 deg. C., Then Heating to 18-30 deg. C. and Recooling to Storing Temperature—*A. L. Stigen, to Aktiebolaget Separator, Stockholm, Sweden. No. 2,569,203. Sept. 25, 1951.*

Method of Preparing Coffee Comprising Roasting, Cooling, Drying, Grinding and Packaging in CO_2—*N. S. Bagdigian, Charlestown, Mass. ½ to A. A. Arabian, Providence, R. I. No. 2,569,217. Sept. 25, 1951.*

Frozen Confection Consisting of Two Layers With Dissimilar Intermediate Core to Grip Stick Holder—*H. C. Gibson, Lancaster, Pa. No. 2,570,031. Oct. 2, 1951.*

Deep-Fat Cooking Apparatus Comprising Integrated Forming, Proofing and Frying Sections With Carrying Device to Move Product-Supporting Trays Through Sequence—*H. T. Hunter, Baltimore, to Doughnut Corp. of America, New York. No. 2,570,127. Oct. 2, 1951.*

Poultry Killing Rack Containing Endless Conveyor with Cone-Shaped Bird-Receiving Holders—*L. A. Merrick, Adrian, Mich. No.*

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2,570,143. Dated Oct. 2, 1951.

Continuous Concentration of Milk at Temperature Below Pasteurization Range in Apparatus Employing Refrigerant Gas for Heating and Evaporating Solution for Cooling Condensate.—*J. A. Cross, Westerville, Ohio, to Mojonnier Brothers Co., Inc. Chicago.* Nos. 2,570,210, 2,570,211, 2,570,212, 2,570,213. Oct. 9, 1951.

Poultry Plucking Machine Consisting of Rotating Shaft Supporting Two Disk Wheels With Alternate Rows of Long and Short Fingers—*D. I. Harvey, Plainwell, Mich.* No. 2,571,034. October 9, 1951.

Vegetable Cleaning and Separating Machine—*G. J. Olney, Westernville, N. Y.* No. 2,571,056. Oct. 9, 1951.

Method of Making Ice Cream by Partially Freezing, Incorporating Air to at Least 125 Percent Overrun, Chilling to Plastic Form, Compressing to not Over 100 Percent Overrun—*R. Horton, Groton, Conn. to National Dairy Products Corp., New York.* No. 2,571,136. October 16, 1951.

Lard Modified by Heating in Presence of Metal Alcoholate at About 50-150 Deg. C.—*R. J. Vander Wal, Chicago, and L. A. Van Akkeren, Oak Park, Ill. to Armour and Co., Chicago.* No. 2,571,315. October 16, 1951.

Whole Eggs Spray-Dried then Moved in Successive Banks Through Dehumidified Hot Air, Followed by Rapid Cooling—*W. N. Lindsay and P. C. Wilbur, to Food Machinery and Chemical Corp. San Jose, Calif.* No. 2,571,459. Oct. 16, 1951.

Preserving Chocolate Candy by Enclosing in Insulated Vapor Barrier, Freezing, and Storing at Deep-Freezing Temperatures—*F. J. Arnold, to Fannie May Candy Co., Chicago.* No. 2,571,516. Oct. 16, 1951.

Method of Preparing Boned Turkey by Making Three Incisions, Turning the Meat Back on Itself, Then Removing Skeleton—*D. Cutrera, San Francisco., Calif.* No. 2,571,544. Oct. 16, 1951.

Apparatus for Preserving Vitamin Content of Grain by Treating With Fluid Medium—*D. S. Fernandes, Paramaribo, Surinam, Dutch West Indies, to Vita-Rich Rice Process Ltd., New York.* No. 2,571,555. Oct. 16, 1951.

Fortifying Essential Oil of Spice by Extracting Comminuted Corresponding Spice Including Non-Volatile Oils, Oleoresins and Coloring Matter—*L. A. Hall, Chicago, and L. Sair, Evergreen Park, Ill., to The Griffith Laboratories, Inc., Chicago.* No. 2,571,-867. Oct. 16, 1951.

Distance and Bearing Plate for Cane Sugar Mills—*F. Hegenbarth, to Vulcan Iron Works, Wilkes-Barre, Pa.* No. 2,571,873. Oct. 16, 1951.

Continuous Marshmallow Mixing Device Consisting of Annular Shell Containing Rotor With Concentric Ribs Interposed Between Ribs on Outlet End Plate, With Means for Introducing Gas Under Pressure—*E. T. Oakes, to E. T. Oakes Corp., Douglaston, N. Y.* No. 2,572,049. Oct. 23, 1951.

Cooking Apparatus With Combination Lining and Jacket Held Together by Bolts and U-Shaped Rod That Forms Lengthwise Moveable Anchorage—*N. J. Peters, to Damrow Brothers Co., Fon Du Lac, Wis.* No. 2,572,192. Oct. 23, 1951.

Starch and Gluten Recovered From Wheat Flour by Mixing Dough Until Gluten is Hydrated, Then Repeatedly Stretching and Washing With Water to Remove Starch and Finally Mechanically Separating the Purified Gluten From Starch Slurry—*J. F. Welch, A. H. Goodman, Holland, Mich. and D. M. Levitt, Great Neck, N. Y. to Doughnut Corp. of America, New York.* No. 2,572,-225. Oct. 23, 1951.

Machine for Rounding Angularly-Shaped Pieces of Food Comprising Rotating Drum With Parallel Grooves and Ribs Fitting Within an Inclined-Wall-Cylinder That can be Variably Positioned—*S. M. Hibbard, Macedon, N. Y., to Canning Machinery Inc., Rochester, N. Y.* No. 2,572,262. Oct. 23, 1951.

Milk or Cream, Reconstituted From Butterfat, Milk Powder and Water by Heating and Mixing Components, Then Continuously Centrifuging With Alternately Increased and Decreased Discharge Rates Effecting a Rapid Vibrating Action on Mixture—*G. J. Strezynski, Chicago, to De Laval Separator Co., New York.* No. 2,572,-287. Oct. 23, 1951.

Fish Splitting Machine Utilizing Continuous Conveyor With V-Shaped Channels and Laterally Adjusted Splitting Means Lowered Into Channels—*A. L. Christiansen, Willowbrook, Calif.* No. 2,572,316. Oct. 23, 1951.

Coffee Roasting Machine Employing Electrically Heated Drum With Infra-Red Lamps Trained on External Surface and Means for Automatically Driving Drum When Predetermined Temperature is Reached—*A. S. Torres,*

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Kinderhook, N. Y. No. 2,572,678. Oct. 23, 1951.

Coffee Roasted by Admitting Green Beans to Roaster Preheated to 400 Deg. F., Applying Heat Until They are Dehydrated, Discontinuing Heating and Allowing Exothermic Action to Heat Batch to 360-410 Deg. F. Before Removing and Cooling—*A. S. Torres, Framingham, Mass. No. 2,572,679. Oct. 23, 1951.*

Apparatus for Preparing Sheet of Fatty Material Consisting of Screw Conveyor Feeding Conduit Which Includes Means for Compacting and Spreading Disaggregated Material, Heating and Extruding—*M. L. Balzarini, Rockport, Mass. No. 2,572,833. Oct. 30, 1951.*

Full Flavored Fruit Concentrates Prepared by Stripping Non-Pomaceous Juice of Volatile Flavors, Depectinizing, Low Temperature Concentrating, Adding Back Flavor in Form of Recycled First and Second Essences—*R. P. Homiller, Three Tuns and N. H. Eisenhardt, Philadelphia, to U.S.D.A. No. 2,572,846. Oct. 30, 1951.*

Sausage Stuffer Attachment Consisting of Auxiliary Feed Screw in Stuffer Discharge Tube Which Couples to and Rotates With Feed Worm in Inlet Grinder Housing — *L. J. F. Ell, to Aktiebolget Elektrolux, Stockholm, Sweden. No. 2,572,917. Oct. 30, 1951.*

Starch Manufacturing Process Wherein Grits and Fiber From Steeping and Cracking are Disintegrated to Fine Particles With Water Added to Effect Continuous Hydration—*W. B. Newkirk, La Grange, and E. H. Williams, Glen Ellyn, Ill., C. A. Rietz, San Francisco and A. B. Dunwody, Evanston, Ill., ½ to Corn Products Refining Co., New York, ½ to Reitz Mfg. Co., San Francisco. No. 2,573,048. Oct. 30, 1951.*

Soluble Coffee Produced by Extracting 18-20 Percent by Weight of Roasted Ground Beans With Water, Then Hydrolyzing Grounds by Acidifying Aqeous Colloidal Suspension, Cooking, Raising pH to Form Insoluble Sulfate Suspension Which is Cooled, Centrifuged and Filtered to Provide Solution, Which is Concentrated, Added to Original Extract, Then Mixture is Dried—*P. J. Clough, Reading, R. S. Morse, Waban, E. G. Hellier, Medfield, W. A. Stauffer, Weston, Mass. to National Research Corp., Cambridge, Mass. No. 2,573,406. Oct. 30, 1951.*

Apparatus for Pickling Food Products With Means for Agitating so That Solution Will Spill From Main Tank Into Discharging Enclosure, and Provision for Replenishing Solution—*J. J. Mackin, to Green Bay Food Corp., Green Bay, Wis. No. 2,573,468. Oct. 30, 1951.*

Frozen Concentrated Fruit Juices Made by Stripping and Concentrating Volatile Aromas, Concentrating Stripped Juice to 50 Deg. Brix, Depectinizing, Adding Less Than 1/25 Volatile Concentrate, Then Freezing—*R. K. Eskew, Glenside, R. P. Homiller, Three Tuns and G. W. M. Phillips, Philadelphia, to U.S.D.A. No. 2,573,699. Nov. 6, 1951.*

Crystallized Fruit Spread Made by Mixing Fruit Components With Invert Sugar, Evaporating to About 80-86 Percent Solids, Initiating Crystallization With Dextrose Hydrate, and Allowing it to Proceed Below 100 Deg. F.—*J. W. White, Willow Grove, Pa. to U.S.D.A. No. 2,573,750. Nov. 6, 1951.*

Pretzel Extruding, Dough Rolling, and Forming Machine Employing Rotating Cylinder With Series of Hingidly Connected and Contiguous Arcuate Segments Encircling Cylinder in Spaced Relation—*W. M. Young and L. B. Paules, Harrisburg, Pa. No. 2,573,754. Nov. 6, 1951.*

Method of Packaging Pie Crust Mixtures Including Shortening by Agitating in Confined Space Into Discrete Separate Particles Which can be Discharged in Fluffed Condition, Into Packages—*W. A. Reed, Larchmont, N. Y. No. 2,573,872. Nov. 6, 1951.*

Shrimp Peeling Machine Consisting of Three Axially Inclined Oscillating Rollers, Two Spaced Apart and the Third Disposed Below to Form a Channel for the Raw Shrimp—*F. S. Lapeyre, New Orleans, and J. M. Lapeyre, III, Houma, La. to Peelers Inc., Houma, La. No. 2,574,044. Nov. 6, 1951.*

Method of Producing Stabilizing Ingredient for Food Products From Aqeuous Starch Suspension by Gelatinization and Subsequent Enzymatic Saccharification, Boiling to Kill Enzymes, Adding Small Percentage of Comminuted Farinaceous Material, and Drying—*C. G. Harrel, and R. O. Brown, to Pillsbury Mills, Inc., Minneapolis. No. 2,574,179. Nov. 6, 1951.*

Rack for Meat Smoking Operations With Supporting Members That can be Swung Parallel to or at Right Angles to the Main Frame—*J. O. Cadwallader, Rocky Ford, Colo. No. 2,574,319. Nov. 6, 1951.*

Peeler With Rotating Fruit Holder and Peeling Mechanism Fixed Above and Carried Around Central Axis of Machine—*B. A. Rutherford, Sebastopol, Calif. No. 2,574,761. Nov. 13, 1951.*

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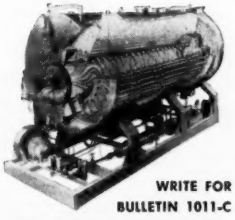

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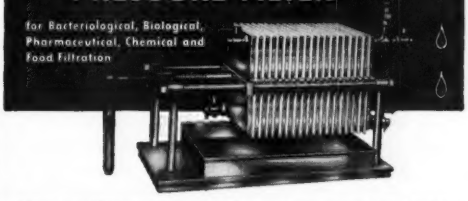

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Jet Pumps

Bulletin 512 sets forth many uses for jet pumps, such as agitating liquids, circulating solutions, washing containers, milk bottles, boilers, etc. Information is given on installation, operation, maintenance, and service parts available. —*Penberthy Injector Co., 1242 Holden Ave., Detroit 2.*

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Power Plant Gear

Booklet 2410 of 44 pages discusses coal and ash handling equipment for power plants. Included are facts on unloading coal, auxiliary unloading, coal storage and reclaiming, crushers, transporting and distributing equipment, ash handling, and water intake screens.—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1.*

Circle 221D on Reader Service Card

Air Conditioners

Divided into three sections, Catalog B-5164 presents material on (1) air conditioning, (2) air handling apparatus, and (3) electronic air cleaning equipment. 16 pages.—*Sturtevant Div., Westinghouse Electric Corp., Hyde Park, Boston 36.*

Circle 221E on Reader Service Card

Sewage Pumps

Service is keynoted in Bulletin W-317-B12 describing pumps for sump, sewage, and drainage. Pumps have impellers described as nonclogging and capable of passing solids and stringy material.—*Worthington Pump & Machinery Corp., Harrison, N. J.*

Circle 221F on Reader Service Card

Pipe Line Strainers

Dimensional and pressure graphs are among features of 15-page bulletin giving information on types of pipe line strainers. Effect of flow rate, screen loading, viscosity of fluid on pressure drop, etc., are among additional data. Manual 951.—*J. A. Zurn Mfg. Co., Erie, Pa.*

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Control Equipment

Instrument Panels

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Attractive 36-page bulletin describes complete line of filter papers and accessories. Twelve pages are devoted to a reference table for filtrations in inorvanie analyses. Included are references to Government publications dealing with analytical filtering, methods for testing filter papers, etc.—*Schleicher & Schuell Co., Keene, N. H.*

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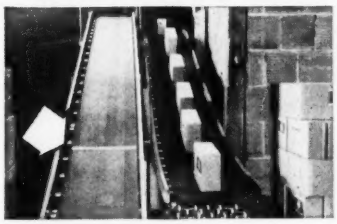

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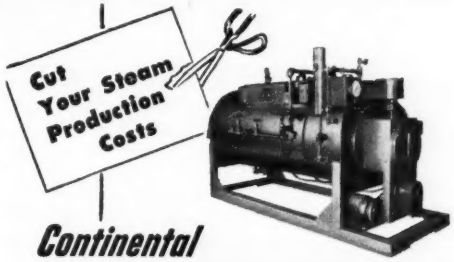

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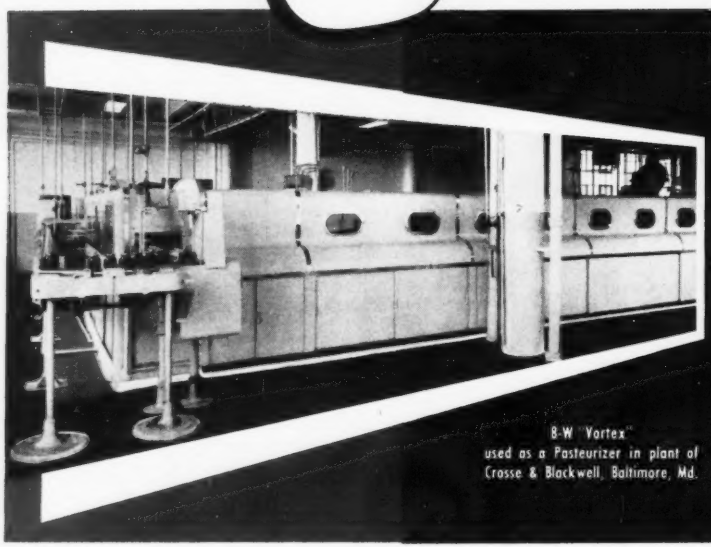

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Voltage Regulator

New compact regulator is stated to occupy less switchboard space, is meter-like in appearance, has built-in voltage adjusting rheostat, and is of dust-proof design with moving parts enclosed. There are two models, one having 34-step commutator, other 50-step. Units have maximum ratings of 157 kva. and 438 kva. at 3,600 rpm., respectively. Bulletin 14B6143A, 4 pages.—*Allis-Chalmers Mfg. Co., Milwaukee 1.*

Circle 223A on Reader Service Card

Metal Detector

Inspection of thin-section products, such as chewing gum strips, noodles, and other materials in sheet-form, is function of metal detector described in Catalog E-61. Metallic particles as small as .039 in. dia., magnetic or non-magnetic, are indicated. 4 pages.—*Eriez Mfg. Co., Erie, Pa.*

Circle 223B on Reader Service Card

Steel Tops for Lab Units

Release of 2 pages discusses application of stainless steel tops for laboratory furniture. Each top, supported by plywood sections, is made in one piece with splashback and reagent shelf. Over 30 percent non-ferrous alloying materials are contained in tops, making for high resistance to reagents.—*Fisher Scientific Co., 717 Forbes St., Pittsburgh 19.*

Circle 223C on Reader Service Card

Filter Gages

A variety of mechanically operated filter gages are described in Bulletin 450-H10. Choice of table or floor-stand mounting, and employment of indirect fluorescent illumination are some of features. 4 pages.—*Builders-Providence, Inc., 345 Harris Ave., Providence 1, R. I.*

Circle 223D on Reader Service Card

Laboratory Equipment

The new 14th edition of *What's New for the Laboratory* illustrates and describes a bevy of the latest equipment. Included: Self-pumping still, electric pipette washer and dryer, automatic pipette and vial filling machine, angle head centrifuge, spigots, manometer, and coated ground glass joints. 14 pages.—*Scientific Glass Apparatus Co. Inc., Bloomfield, N. J.*

Circle 223E on Reader Service Card

Materials Handling

Electric Trucks

New 12-page brochure discusses functions of electric trucks in capacities from 1,000 to 100,000 lb. Safety features are played up. Complete specification chart details models, capacities, weights plus load center, heights, turns, etc. Bulletin P5151.—*Yale & Towne Mfg. Co., Roosevelt Blvd., Philadelphia 15.*

Circle 223F on Reader Service Card

Fork-Truck Case Study

Accent is on service in new study showing how one company cut carloading time in half by use of fork trucks. Storage capacity was reported doubled, with man-hours reduced to a minimum in one handling step. Illustrated Bulletin 243.—*Baker Industrial Truck Div., 1250 W. 80th St., Cleveland 2.*

Circle 223G on Reader Service Card

Hydraulic Lift Trucks

Bulletin 207 gives broad picture of line of hydraulic lift trucks. There are complete specifications and explanations of various standard lift, pallet, and high-lift models. 4 pages.—*The Raymond Corp., 6286 Madison St., Greene, N. Y.*

Circle 223H on Reader Service Card

Tractor Shovels

Fifty on-the-job photos show uses of tractor shovel in moving bales, bags, dried fruit, salt, sugar, peanuts, also debris. Unit has multiple reverse speeds, full hydraulic bucket control, and automatic bucket tipback. Operator is located for full visibility. Catalog 205, 12 pages.—*Frank G. Hough Co., 835 7th St., Libertyville, Ill.*

Circle 223I on Reader Service Card

Conveyors

Shown in 4-page folder is conveyor equipment designed to facilitate continuous flow of materials. Practical utility in a number of plants is pictorially outlined.—*J. C. Corrigan Co. Inc., 41 Norwood St., Boston 22.*

Circle 223J on Reader Service Card

Wire Cloth

Bulletin 101 describes uses of industrial wire cloth for filtration, sizing, screening, cleaning, straining, catalysts, dehydration, and conveying. Nine basic weaves are offered. 4 pages.—*The Cambridge Wire Cloth Co., Cambridge, Md.*

Circle 223K on Reader Service Card

Equipment Charts

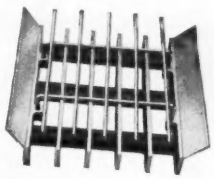
By cross reference charts, new catalog of 8 pages presents data on fork-lift trucks and attachments and devices, also towing tractors and hand pallet and platform trucks. Specifications are given on all types.—*Clark Equipment Co., Battle Creek, Mich.*

Circle 223L on Reader Service Card

Anent Fork Trucks

Handling Materials Illustrated,

you can't drop a nail through this grate



Climb up high and drop a steel nail on this magnetic grate. Or throw nail as hard as you can against it. The nail simply can't get through.

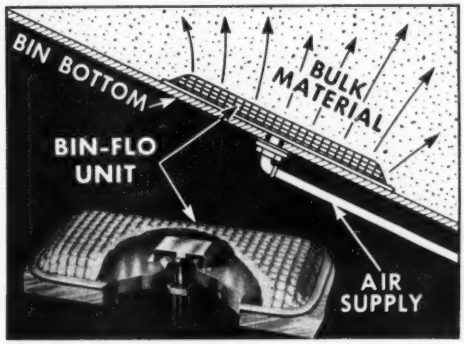
It's obvious that the nail or other iron or steel piece will first strike a grid wire or a grate bar. That will check the momentum. Then the object will be caught with a strong magnetic grip.

The Bauer Magnetic Grate is laid on a frame in a hopper throat or floor opening to catch all steel and iron inclusions in flowable materials—grain, nuts, seeds, fruits, coffee, tea, spices, sand, clay, lime, chemicals. The grates work well in liquids, too.

Ask for Bulletin M-3-A which fully describes the magnetic grate and other Bauer Magnetic Separators.

THE BAUER BROS. CO.

1740 Sheridan Ave. • Springfield, Ohio



BIN-FLO USES SMALL VOLUME OF AIR AT LOW PRESSURE

KEEPS BULK MATERIALS MOVING

BIN-FLO units in bins, chutes, hoppers, etc., restore flow characteristics to dry, finely ground materials which tend to pack or bridge in storage. Types for all materials and conditions. No moving parts; simple installation; negligible operating cost; no maintenance cost.

BIN-DICATOR bin level indicator—"The Eyes of the Bin"—automatically reports levels of materials in storage; automatically controls filling machines; prevents waste.

NEW 20-PAGE BOOK FREE

THE BIN-DICATOR CO.

13946-R Kercheval • Detroit 15, Mich.

LABEL SEAL-IT

Simplifies Bag Sealing and Labeling!

SEALS & LABELS IN ONE EASY OPERATION!

No staples, no pins, no hand work!

Simultaneously attaches labels and heat seals all suitable bag materials up to 6" wide; also seals to 10" wide. Cuts handling time; saves labor; **pays for itself in 6 months!** Insures tight pack even with oversize bags by folding tops first, if desired. Fast, safe operation with automatic Phantom Feed. Other Heat Seal-It Machines available. Write for circulars.

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Heat for Every Transport Need
Independent of Vehicle Engine

CARGO COOLERS
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Get literature, catalogs or detailed information that you need from manufacturers of equipment, materials, supplies, ingredients.

for your convenience

USE READER SERVICE

Vol. 9, No. 3, discusses features of five new fork trucks, also general factors in fork truck application. The units have shorter wheel bases. And more power and speed, also quieter operation, are reported. 8 pages.—*Towmotor Corp., 1226 E. 152nd St., Cleveland 10.*

Circle 223M on Reader Service Card

Trucks, Conveyors, Casters

Informative 28-page catalog features photos, sketches, charts, and descriptive data on line of powered conveyors, hand trucks, steel-forged and cold-forged casters.—*The Rapids-Standard Co. Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.*

Circle 224A on Reader Service Card

Plant Supplies

Food Chemicals

New 48-page catalog describes wide range of food products, including essential oils, balsams, aromatic chemicals, oleoresins, certified colors, flavoring materials, and basic perfume products. Prices are listed.—*Magnus, Mabee & Reynard, Inc., 16 Desbrosses St., New York 13.*

Circle 224B on Reader Service Card

Sprayer

All-purpose sprayers for use in cleaning trucks, cars, floors, machinery, etc., are discussed in 12-page bulletin. Graphs and detailed illustrations are given.—*Hanson Chemical & Equipment Co., Beloit, Wis.*

Circle 224C on Reader Service Card

Valve Lubrication

Importance of proper valve maintenance is stressed in 4-page publication, *Proper Valve Lubrication—A Prerequisite to Good Control.* Various types of lubricants, their function and application, are covered. Text is reprinted from *Instrumentation*, company's own magazine.—*Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44.*

Circle 224D on Reader Service Card

Concentrates

Botanical drugs, chemicals, insecticide concentrates, and rodenticides, as prepared for manufacturers, are topics in 52-page catalog. Also described are company's processing and manufacturing facilities, foreign representation, and research organization.—*Prentiss Drug & Chemical Co. Inc., 110 William St., New York.*

Circle 224E on Reader Service Card

Welding Metals Chart

Colorful wall chart lists bronze weld rod and wire products. Additional data include applications, mechanical properties, and recommended current and polarity.—*Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 46.*

Circle 224F on Reader Service Card

Non-Ionic Surfactants

Esters of glycerol, glycols, and polyethylene glycols are described in 24-page booklet. Given are tables of physical and chemical specifications of non-ionic polyhydric alcohol fatty acid esters. Special grades of edible surface-active agents are available for use in food products.—*Glyco Products Co. Inc., 26 Court St., Brooklyn 2.*

Circle 224G on Reader Service Card

Miscellaneous

Storage Files

Minature broadside spotlights large and small installations of chemically impregnated fiberboard storage files. Company invites user to make practical tests comparing product with files of other construction. Cited are durability and low cost.—*Convoy, Inc., Station B, Box 216, Canton 6.*

Circle 224H on Reader Service Card

Brick and Tile Construction

Showing how brick and structural tile can be used in many buildings to reduce or eliminate use of critical materials, 8-page bulletin puts emphasis on saving of structural steel.—*Structural Clay Products Institute, Washington 6.*

Circle 224I on Reader Service Card

Fire Protection

Devices and agents for fighting fires are covered in 32-page booklet, *Correct Fire Protection.* Educational in tone, booklet stresses importance of knowing type of equipment needed for specific fire hazards.—*American-LaFrance-Foamite Corp., Elmira, N. Y.*

Circle 224J on Reader Service Card

Free Literature—Quick Way

Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard inside the back cover. Then sign at the bottom and mail. No postage is required.

For your convenience, too, all items in this department are listed and keyed in the Reader Service Section under "Editorial: New Technical Literature."

Food Sales increase 15%* when ZEST® is added!

*Test reveals *regular* cafeteria customers bought *15% more food* when ZEST Monosodium Glutamate was used!

It's fresh, natural flavor that sells food. Tests prove it. You have always known it. Now you can sell more food than ever before by guarding the flavor appeal of your foods with ZEST . . . the miracle seasoning that ends gradual "flavor fading" in processed foods. Alert food processors everywhere are discovering the advantages of using ZEST in a wide range of canned and frozen foods.

See how Staley's Monosodium Glutamate—*by magnifying natural flavor*—can sell more canned or frozen foods for you!

ZEST is Staley's 99+% pure, instantly soluble Monosodium Glutamate. It brings out every bit of the natural food flavor appeal . . . yet adds no flavor, no aroma, no color of its own. You can magnify the flavor of meats, vegetables, seafood, chilies, stews, chowders, gravies and sauces. Simple to use, ZEST may be automatically added with your present equipment during processing . . . without any change in your formulas.

Improve the flavor of your processed foods . . . increase sales and profits as many leading food processors are now doing. Get the full flavor complete story of ZEST in processed foods!

Zest®

Staley's 99+% Pure Monosodium Glutamate

A. E. STALEY MFG. CO.—Decatur, Ill., U.S.A.

STALEY

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Research Pioneers in Products from CORN and SOY BEANS

Every Top Management Man...In Every Industry

SHOULD BE ABLE TO ANSWER THESE QUESTIONS ABOUT A MOST CRITICAL EMERGENCY IN OUR COUNTRY'S AFFAIRS

Q. Why is iron and steel *scrap* a matter of importance to me?

A. Steel for our country's military program and civilian economy is being produced at the annual rate of 107,000,000 tons in 1951 . . . 119,500,000 tons expected in 1952. Steel-making capacity is being increased now to meet those quotas.

What Do I Get For My Scrap?

In addition to being paid for your scrap, you remove nuisance inventory from your plant—saving valuable floor space. Also, you have a better chance of *getting* new steel or steel products. But, *most important*—you help alleviate a dangerous condition threatening our country's capacity to rearm and satisfy civilian requirements at the same time.

Q. How does scrap figure in the production of steel?

A. Steel is composed, generally speaking, 50% of pig iron, 25% of "production" scrap (that is, the scrap which is produced as a by-product of steel-making) and 25% of "purchased" scrap.

Q. Is scrap getting scarce?

A. Yes. The supply of *purchased* scrap is not increasing fast enough to meet the needs of increasing steel production.

Q. What if the needed scrap isn't obtained?

A. Open-hearth furnaces will not be able to operate at capacity. That will mean a loss of steel production . . . and fewer products made of steel.

Q. Why not use pig iron instead of scrap?

A. Every ton of scrap conserves approximately 2 tons of iron ore, 1 ton of coal, nearly ½ ton of limestone and many other vital natural resources—to say nothing of the extra transportation facilities that would be otherwise required.

Q. How can *more* scrap be furnished?

A. By everybody pitching in—as we always do in every emergency—and searching out all possible sources of scrap.

Q. What are these sources?

A. Metal-fabricating plants normally turn over to scrap dealers the scrap left from machining. But there's not enough of this to fill our present enormous need. So everybody—both in and out of the metal-fabricating industries—must sell scrap in the form of *idle metal*.

Every pound of idle metal is needed to keep our steel mills operating at top capacity. Sell your idle metal to a local scrap dealer right away.

What Do I Do *First*?

Write for free booklet. It tells how to set up a Scrap Salvage Program in your plant. Thousands of plants are cooperating. Do your part now! Address Advertising Council, 25 West 45th Street, New York 19, N. Y.

Q. *We* don't *produce* scrap—how can *we* help?

A. Scrap is any kind of iron and steel that's gathering dust—obsolete machines or structures, jigs and fixtures, pulleys and wheels, chains and track, valves and pipe—*anything* with rust on it or dust on it. Non-ferrous scrap is needed, too.

Q. What do we do with it when we find it?

A. Use your normal channels or get in touch with a recognized scrap dealer.

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More than 80 years of experience serving the food and beverage industries
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WA 4-8800

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Chemists — Bacteriologists — Food Technologists
Specialists in Canned and G'assed Foods
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1403 Eutaw Place, Baltimore 17, Maryland

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received by February 25th will appear in the March issue subject to limitation of space available. Address copy to the

FOOD ENGINEERING

330 W. 42nd St., New York 36, N. Y.

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO., Inc.

PHILADELPHIA, PA.

3 WAREHOUSE LOCATIONS

Proper Temperature for Frozen Foods

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For the Food Processor

CARROT OIL makes foods golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET

New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

the advertisements in the SEARCHLIGHT SECTION on the following pages are live opportunities in the field of food processing and distribution.

Each announcement represents a current Want or Offering of an organization or individual in the field, with some element of profit in each for whoever can fill the need. Some have money-saving possibilities, others are opportunities for more business; many are employment opportunities; still others offer property, or equipment—used or surplus new equipment.

"Searchlight" advertisements are constantly changing. New opportunities are constantly finding their way into this great Want medium, each issue. Regular reading of the "Searchlight" pages can be as important to you as reading the editorial sections; Editorial matter is NEWS OF OPPORTUNITIES offered in the industry.

for EVERY business WANT "Think SEARCHLIGHT first"

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(Classified Advertising)

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$1.20 A LINE. MINIMUM 3 LINES. To figure advance payment count 5 average words as a line.

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The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured 7/8" vertically on one column, 3 columns—30 inches—to a page.

Individual Spaces with border rules for prominent display of advertisements.

NEW ADVERTISEMENTS: Address N Y Office, 330 W. 42 St., N Y 36 N Y for March issue closing Feb. 25

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

WANTED
ENGINEER

for small food machinery manufacturer. Small, well established company, successful in designing and manufacturing machinery for food processing; needs services of engineer with broad experience and successful record designing machinery, handling men, and as general production engineer. This is an excellent opportunity for a fully qualified person looking for opportunity in small company in Midwest.

P-2882, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

Due to expanding business, we have openings at present for:

- PLANT SUPERINTENDENTS
- DIVISIONAL SALES MANAGERS
- OFFICE MANAGERS
- ACCOUNTANTS
- AND OTHER POSITIONS IN THE MANAGEMENT

Products manufactured and sold are margarine, salad dressings, cucumber wafers, prune juice and peanut butter.

Address in writing, your reply to Mr. Stephen J. Bartush, president, Shedd-Bartush Foods, Inc., 14401 Dexter Boulevard, Detroit 6, Michigan. Give in first letter, age, marital status and full detail of your past experience, territories covered, etc.

No personal interviews granted until arranged for.

P-2829, Food Engineering
520 No. Michigan Ave., Chicago, Ill.

RESEARCH CHEMISTS

Openings for B.S. graduates, with Laboratory experience, with long established nationally known concern located New York City. Experience in food field preferred. Experience in products development also desirable. Salary commensurate with experience & qualifications. 5 day week. Submit detailed resume of experience, education, age, present salary, etc.

Box No. P-2988, Food Engineering
330 W. 42nd St., New York 36, N. Y.

ORGANIC CHEMIST

To work on development of organic analytical methods at Springfield, Illinois. BA or MA in organic chemistry required. Give complete background of education and experience. Salary commensurate with ability and experience. Write RCD, Personnel Department.

PILLSBURY MILLS, INC.
Minneapolis 2, Minnesota

CHEMISTS

Packaging field experience preferred. Large well-known concern located New York City has opening for B.S. graduate with minimum of one (1) years experience in Laboratory work. Salary commensurate with experience and qualifications. 5 day week. Submit detailed resume of experience, education, age, present salary, etc.

Box No. P-2989, Food Engineering
330 W. 42nd St., New York 36, N. Y.

FOOD CHEMISTS

One of our clients seeks
TECHNICAL DIRECTOR.
Must be expert on "formula feeds" as against "mixed". Must be man of hi-potentials. Excellent opportunity. $15,000.
Call, write or wire:—Gladys Hunting (Consultant)
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Employers Should Have Some Benefits Too!

With that in mind busy food executives find that my files are invaluable to them when they consult me for that particular expert they want.

Your requests for personnel are given careful and interested attention. Applicants are only submitted on the strength of their proved worth and investigated background.

JOHN MC CLOUD
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Qualified Employment Agency
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EXPERIENCED EGG Man capable of taking complete charge of buying and managing modern egg breaking plant for reputable well established firm. Plant in south. Excellent opportunity. Our organization knows of this ad. Replies kept confidential. Answer in detail to P-2128, Food Engineering.

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MANUFACTURERS AGENT. Some exclusive territories available. "Ronningen" quick coupling non-short-circuiting water filters. 50 to 5000 GPM. Pressures to 200#. Excellent opportunity for engineering salesman handling pumping machinery or heavy industrial equipment. Liberal commission basis. Ronningen Mfg. Co., Vicksburg, Michigan.

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SALARIED PERSONNEL $3,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

CHEMICAL ENGINEER qualified for: small plant mgt.; food engr.; tech. sales; administrative and tech. liasion between prod. and mgt., field and home office; supervision of extension programs or quality programs. PW-3141, Food Engineering.

FOOD TECHNOLOGIST, M.Ch.E., 4 years development and production in fermentations, syrups, baked goods. Desires position in research or production. National New York area. PW-3123, Food Engineering.

FOOD TECHNOLOGIST—Plant management, successful research, profitable development and processing of quality foods, beverages, flavors. PW-2948, Food Engineering.

MAN WITH General business background, plus economic and legal training and experience, seeks challenging employment in business with long range opportunities. Paul L. Harris, 500 Maple Street, Shenandoah, Iowa.

PRODUCTION AND General Administrative Executive for Candy Plant. Broad experience in chocolate and hard candy production management, development work, plant layout, installation and sales co-ordination. Age 31. PW-2206, Food Engineering.

SALES OR Production Manager, 20 yrs. experience, large scale, cannery and frozen food. Experience all phases management, production, finance, national sales following—experience all types fruits, vegetables, berries, specialties, etc. Just completing reorganization food industry for foreign government, available about March 1-15. Married, age 43. PW-2928, Food Engineering.

SELLING OPPORTUNITY WANTED

IMPORTANT FRENCH Industrial and business firm with works and office in Paris, specialized in the hydrogenation and refining of food and industrial fats, vegetable and animal, solid and fluid, would like to contact first class American firm interested in representations in France and Europe. Write to: Stelladex, 82 Avenue Rapnall, Seine.

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Reg. Patent Attorney. 1234 Broadway, New York 1, N. Y.

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a. Mathematics and Chemistry of Food Technology
b. Food Analysis
c. Nutrition
d. Canning
e. Freezing
f. Preserving
g. Inspection and Grading according to USDA standards
h. Mold Counting and Insect Examination

RESTAURANT MANAGEMENT
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Highly qualified instructors with practical experience as well as European and American degrees in their respective fields.

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If you need qualified personnel, such as: Food Technologists, Laboratory Technicians, Mold Counters, Foremen, Foreladies, Graders and other trained personnel for Quality Control Work please contact the Employment Office of the school.

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Telephone: 83-1301

PLANT FOR SALE

Newark, N. J. Three-story brick building 71,000 sq. ft. Brick garage 10,000 sq. ft. Buildings—sprinkler throughout—2 freight elevators—heating system—loading dock 185 ft.—yard 6,000 sq. ft. 3 steam engines @ 550 K.W., 110 V.D.C.—two Diesels 20 and 40 K.W.—Boiler #1 @ 750 BHP, Boiler #2 @ 900 BHP, 160 lb. rtd. cpty. each. Softest water in state, low taxes, plentiful local labor, easily accessible to varied communities. Only substantial inquiries invited.

BO-2774, Food Engineering
330 W. 42 St., New York 36, N. Y.

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We are now manufacturing over $20,000,000 in various lines and wish to expand by acquisition of assets or stock of one of more industrial companies. In our negotiations the sellers' problems and wishes will receive full consideration. Present personnel will normally be retained.

Address all replies
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233 Broadway, N. Y. 7, N. Y. BA 7-1819

FOR RENT
REFRIGERATED WAREHOUSE

16000 cu. ft. refrigerated space, good equipment. Will lease. Location, Jamestown, New York.

Contact—JACOB WEINSTEIN
109 N. Main St. Jamestown, N. Y.

Rebuilt For New Machine Accuracy

At A Fraction Of The Original Cost

UNION Rebuilt Machinery — Established 1912

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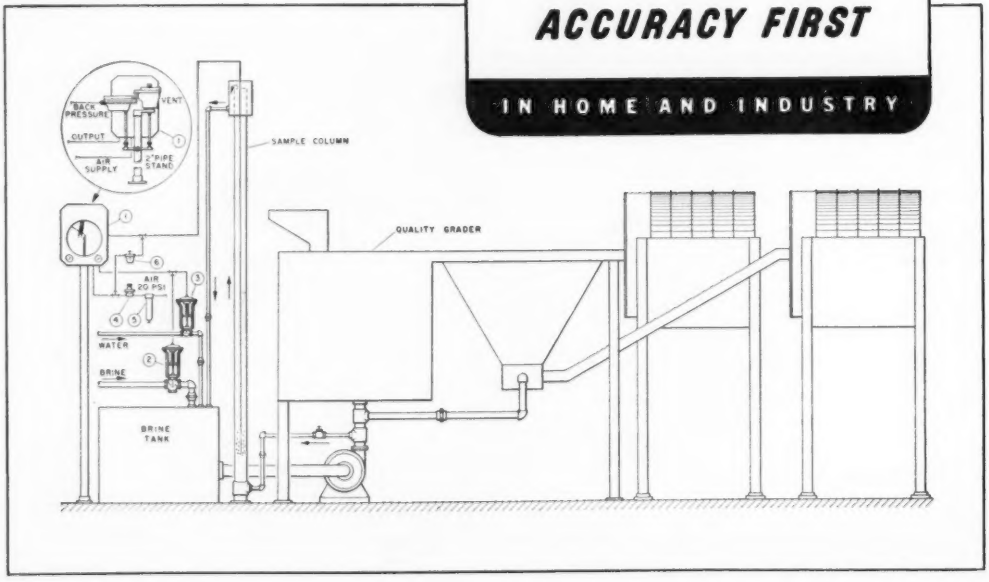

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Advertisements: There is a page number on the postcard for each advertisement. Before the number may appear, L, R, T, B (left, right, top, bottom) locating the ad on the page; small letters following (a, b, c) indicate additional products in the advertisement.

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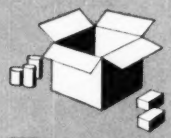

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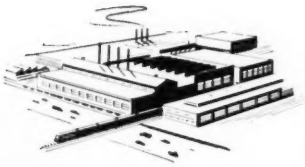

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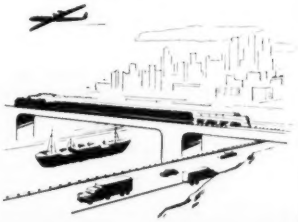

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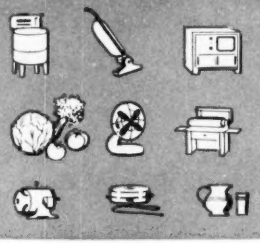

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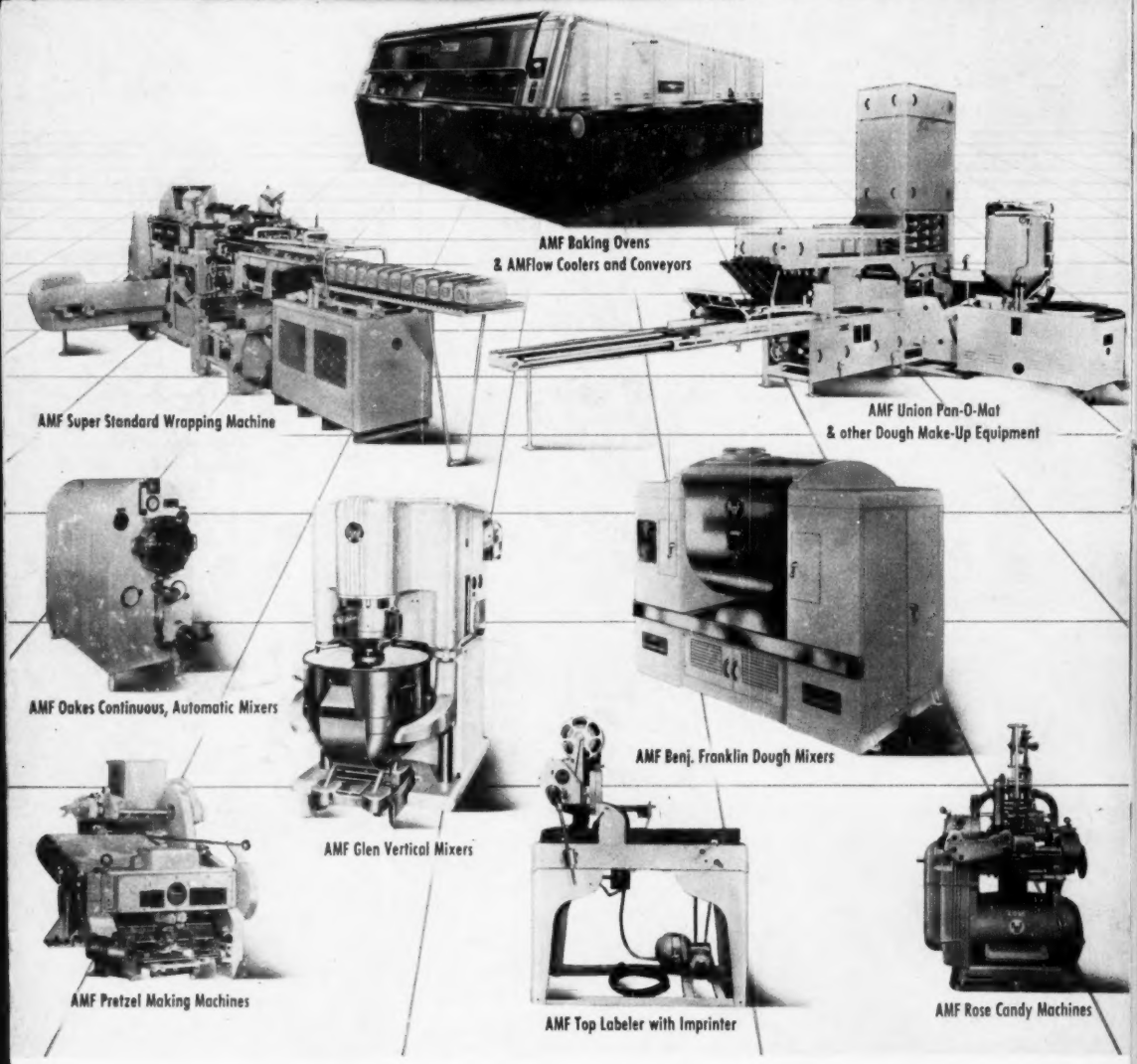
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